WEST VIRGINIA. STATE PLANNING BOARD

REPORT OF THE COORDINATING COMMITTEE IN THE FIELD OF PUBLIC HEALTH 1943

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WEST VIRGINIA
STATE PLANNING BOARD

REPORT OF THE COORDINATING COMMITTEE

in the field of

PUBLIC HEALTH

June 1, 1943

West Virginia State Planning Board

HON. MATTHEW M. NEELY, Governor

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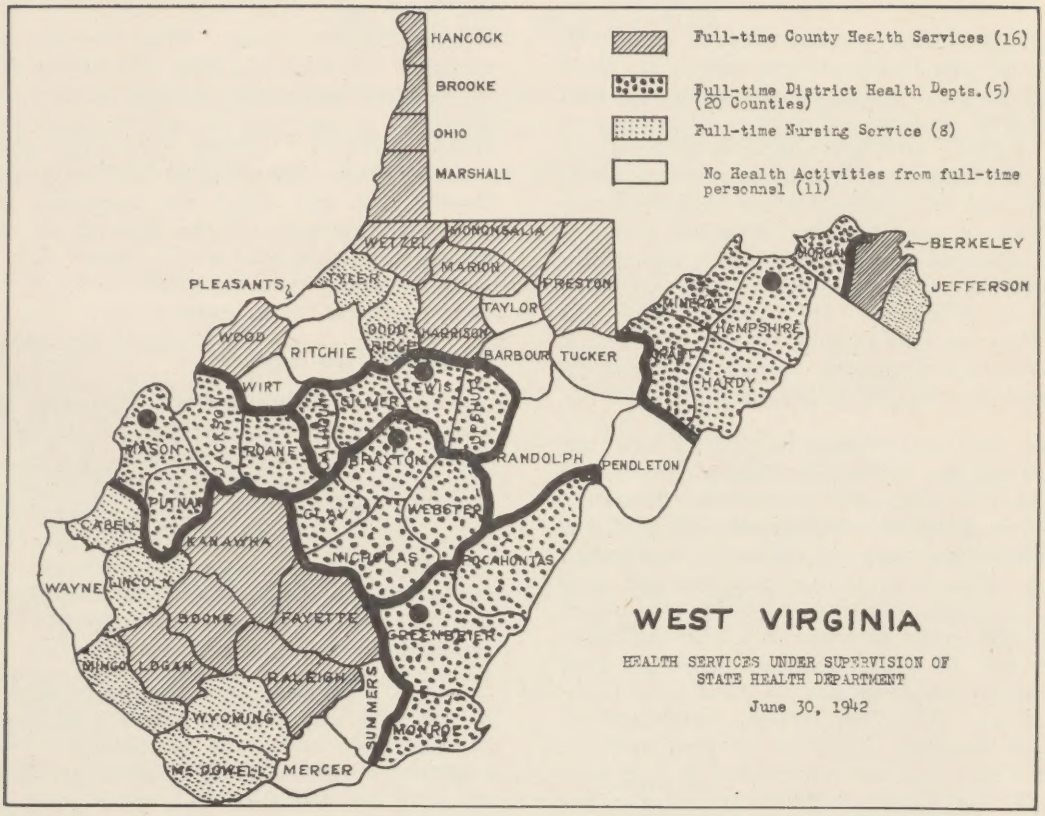


As of June 30, 1942, there were 16 full-time county health units in the state. The personnel in each of these counties consisted of a full-time physician, one or more public health nurses, one or more sanitarians, and a clerk, except in one county which had two of the latter.

There were also five operating districts covering 20 additional counties, with each county having its own public health nurse. Eight other counties had public health nursing services only, while eleven counties had no organized health service.

At that time 51.5 percent of the approximately 1,902,000 people in West Virginia was served by full-time county health units; 18.5 percent was served by district health units; 17 percent had full-time nursing services only; and 13 percent were without organized health services under state supervision.

FOREWORD

The strength, ambition, productiveness and well-being of a people are in direct proportion to their health. A sick body or a sick mind cannot function with one hundred percent efficiency. Because of carelessness, neglect, and ignorance such insidious despoilers as malnutrition, common colds, intestinal disorders, and tuberculosis in its various forms sap the vitality of our people, diminish our resourcefulness, sour our dispositions and materially reduce our creative capacity along all lines of mental and physical endeavor. In addition such ailments, when they become chronic, frequently result in indifference towards moral values and lead to the acceptance of undesirable standards of living.

Other public health fundamentals which are just recently receiving the attention they deserve are those of proper diet, rest, and relaxation. Someone has said that at least 90 percent of our political and social difficulties may be directly attributed to indigestion. This may be an exaggeration, but we do know that such things as undernourishment, allergies, improper combinations of foods, and poor digestion can and do influence our behavior and affect our personal, professional, political, and business relationships. Everyone knows, furthermore, that the human machine must be properly rested. But the point which has not received sufficient consideration is the fact that proper rest includes relief from our daily economic and social strains. Physical exercise alone is not enough. It must be accompanied by mental relaxation. We are nervous, "high-strung", "jumpy", and irritable either because we do not know how or will not take time to get away for a while each day from the trials and tribulations associated with our daily lives. We must learn to eat right, rest properly and master our mental processes if we ever expect to enjoy complete health.

Of first importance at any time, good health is indispensable during an emergency such as we are now experiencing. That millions of man hours of labor are lost and that the productive efficiency of millions more are reduced because of avoidable illness is a national crime for which we should be truly ashamed. Unsafe drinking water, contaminated foods, dirty food handling, filthy streets, smoke and gas filled air, improper garbage and sewage disposal, vicious spread of venereal diseases—all these and many more add up to make such a strong case for good public health that further justification is unnecessary.

Scope of This Report

The West Virginia State Planning Board is well aware of these facts. One of its 17 broad fields of study and investigation is Public Health. In this field four important primary committees, bringing together the knowledge, experience, and judgment of over 25 leaders in public health work, have prepared valuable reports covering the various aspects of such phases as Water Supply, Stream Pollution, Sanitation, Nutrition, and Communicable Diseases.

This coordinated report, in turn, is an integration of the separate primary reports in this broad field. It has been prepared primarily as an important segment of and a work guide in perfecting a "master plan for the physical, social and economic development of the state", as directed in the act passed March 7, 1941 creating the State Planning Board and prescribing its powers and duties. Therefore, emphasis has been placed herein upon problem statements and upon recommendations for education, demonstration, research, promotion and legislation deemed most important to improved public health. For additional supporting information the reader is referred to the original specialized reports of the Primary Committees available at the office of the Executive Secretary, West Virginia State Planning Board, Room 111, Mineral Industries Building, Morgantown, W. Va.

COORDINATED REPORT

of the

WEST VIRGINIA STATE PLANNING BOARD

in the field of

PUBLIC HEALTH

Although not exhaustive, the ensuing pages point out important past, present, and proposed steps to improve public health conditions in West Virginia. Essential background information is first presented as an aid to understanding and appreciating the problems and recommended remedial measures which follow.

I. TRENDS

In Water Supply and Public Health

According to the State Health Department, approximately one-half of the people in West Virginia are served by public water systems. The remaining population, almost entirely rural, depends upon individual water sources such as drilled and dug wells, springs, and cisterns.

The current list of public water supplies in West Virginia records 456 systems supplying 493 communities and serving 908,000 of the state's total population of 1,901,974 (according to the 1940 Census). The relative importance of the various sources of supply for public water systems may be judged from the following:

Table I

Public Water Systems	Number*	Population**
1. Using Underground Water	343	379,000
(a) From Drilled Wells	239	250,000
(b) From Dug Wells	5	11,000
(c) From Springs	39	65,000
(d) From Mine Water	60	53,000
2. Using Surface Water	141	589,000

Ninety-nine of the supplies are publicly owned and 357 are privately owned.

Most of the smaller public systems and practically all of the rural residents depend upon underground water sources. In the aggregate probably 70 percent of the total population in the state uses underground water.

On the other hand most of the larger cities in the state depend upon surface water supplies since underground water sources are generally too limited in yield.

From a practical public health standpoint no surface water can be considered safe without chlorination, and except for small impounded supplies from clean, controlled watersheds or the headwaters of a few mountain streams, complete treatment is desirable. The status of water treatment (public supplies) may be found in the following:

Table II

Treatment	Number*	Population**
Coagulation	106	579,000
Sedimentation	133	614,000
Filtration (pressure)	44	57,000
Filtration (gravity)	103	607,000
Chlorination	197	729,000

Control over the quality of public water supplies is legally vested in the State Health Department. Such control begins before the supply is installed, since prior to initiation plans for water projects must be submitted to the Health Department for approval. Another phase of public health control is that of field inspection of public water supplies by Health Department engineers. All major supplies are checked at least once or twice each year. Personnel limitations, however, prevent frequent visits to the small supplies in the mining towns. In addition, operating reports of water treatment plants are filed with the State Health Department.

* Some communities use water from more than one source and employ two or more of the treatment processes listed. This accounts for overlapping in figures.

** Number of people affected. Many use water obtained from more than one source which may receive two or more treatment processes.

A further control measure requires certification of water plant operators. Under a regulation authorized by law, all plants where water is treated must be in charge of an operator who has qualified for the position by passing a written examination. Bacteriological control of water supply, unless competent local control is available, is provided by the State Hygienic Laboratory. Monthly samples are requested from all major public water supplies. Of the 127 systems serving populations in excess of 1,000 all but 12 were reasonably well sampled during 1942.

Public health activity with regard to private water supplies is confined, for the most part, to educational activity by the local health departments in seeking to stimulate the proper protection of such supplies. Individual private water supplies are sampled upon request. Surveys have indicated that in some localities a high percentage of the private water supplies are not adequately protected. Open springs and poorly constructed and located wells are numerous. Semi-public supplies, such as those found at rural schools, tourist camps, and roadside stands, are inspected and sampled once or twice each year in those counties where full-time health service is available.

Public water supplies no longer play a significant role in the transmission of disease. During the period 1900 to 1915, the amount of sickness and death directly traceable to polluted water supplies was appalling. Quoting from the report of the State Board of Health for 1914-16: "To use a conservative estimate it can be stated that in the past few years there have been at least 1200 deaths yearly from typhoid fever." Considering the population of that date, the typhoid rate must have been about 90 deaths per 100,000 population. The 1940 death rate from typhoid was only 2% of the estimated 1910-1915 rate. All of this reduction cannot be attributed to improved water supplies, but certainly much of it can. It was not unusual to have several water-borne epidemics annually as recent as twenty-five years ago. Only 3 water-borne typhoid epidemics have occurred in West Virginia during the past 12 years, and these were relatively minor. No epidemics have occurred since December, 1938. However, several small public supplies of questionable quality remain in use, and the possibility of future epidemics cannot be dismissed.

The widespread use of chlorine as a disinfecting agent has been the chief factor in the elimination of water-borne disease. Of the 93 communities in West Virginia listed as having populations in excess of 2,000, only 7 do not use chlorine as a final safeguard.

The relative freedom the public enjoys from water-borne disease is a tribute to scientific advancements in water purification and those men responsible for plant operation. The larger surface streams are polluted with sewage and industrial wastes, often to the extent that it becomes difficult to produce a potable water. There is reason to suspect that pollution of a stream may become so intense that treated water from that source may cause illness even though it passes rigid control tests due to the presence of health impairing substances which cannot be readily detected and rendered harmless by methods ordinarily utilized at present.

Pollution of underground water supplies occurs quite often in the limestone areas. The practice of discharging sewage into sink holes, or in some instances, into holes drilled into cavernous formations, is common in the Greenbrier area and in the Eastern Panhandle.

The public has become more exacting in water supply matters during recent years, and a safe water will no longer satisfy unless it is also free of excessive hardness, relatively non-corrosive, and contains no objectionable minerals such as iron and manganese. The consumer quickly complains against any unusual taste or odor.

Indications are that in the future many water plants in West Virginia will seek to improve their finished product by refinements in treatment.

In Stream Pollution Abatement

An effort was made in the interest of improving our own program to get some information on the stream pollution programs of adjoining states by writing to the states of Pennsylvania and Virginia. It was learned that Virginia has no state-wide stream pollution law or program and that Pennsylvania laws in this field are rather similar in many respects, but not superior, to those in effect in West Virginia.

West Virginia Stream Pollution Laws

In order to present a picture of the laws regulating pollution in this state, the pollution laws administered by the three agencies directly concerned with this problem will be discussed in this section. (References are to the West Virginia Code.)

(1) Chapter 16, Article 11 (State Water Commission Act)

The original State Water Commission Act was enacted in 1929. In 1933 the law was reenacted with minor improvements including a section rendering the provisions of the act separable and several. During the 1937 session of the Legislature, the act was amended to give the Commission greater enforcement authority by providing a municipal finance plan for treatment works and the power to levy fines against offenders. This amendment in 1937 completes the act as it is today.

This act provides that the Commissioner of Health, the Chairman of the Public Service Commission, and the Director of the Conservation Commission, and their successors in office, shall constitute the State Water Commission whose duty it is to administer a program of stream pollution control in West Virginia. The Commission has the authority, insofar as available funds will permit, to employ such personnel as is necessary to carry out the program in the state. The act also provides that the Director of the Division of Sanitary Engineering of the State Health Department shall perform such duties as may be requested of him by the Commission.

This law gives the Commission the authority to cite any person causing the pollution of any water to appear before said Commission, there to show cause, if any exists, why the Commission should not issue an order regulating such pollution. After the Commission has made a finding of facts, it is granted the authority to order the pollution corrected by a means approved by the Commissioner. The final order of the State Water Commission must be complied with, except that any party feeling aggrieved by a final order of the Commission may appeal said order to the Circuit Court in the county wherein the pollution originates. The Supreme Court of Appeals has jurisdiction to review the order of the Circuit Court upon application of either party or any intervener. Persons engaged in the mining of coal are exempted from the provisions of this act insofar as mine drainage is concerned.

The Water Commission Act also incorporates provisions of the Revenue Bond Act passed in 1933 which afford a means whereby municipalities bonded to the limit may provide sewage treatment by issuing revenue bonds charged against owners of premises to be served by the contemplated plant.

Furthermore, the Commission has the authority to levy fines of not less than twenty-five dollars nor more than one hundred dollars against all offenders who fail to comply with any order of said Commission. Each day that an offender fails to comply with the Commission's order shall constitute a separate and additional offense.

All acts inconsistent with the Water Commission Act except Chapter 16, Article 1, Section 7, and Article 9, Sections 2 and 3; and Chapter 20, Section 6 of the Code of West Virginia were repealed by enactment of said Water Commission Act. The acts exempted will be discussed below under Public Health and Conservation Laws.

(2) Chapter 16, Article 1, Section 7 (Public Health Laws)

This article provides that no person, municipality, corporation, institution, or agency shall install any system of water supply, sewage disposal, or garbage or refuse disposal in West Virginia until said installation has been approved by the State Health Commissioner or his authorized representative. Authority is also provided for issuance of orders of correction by the State Health Commissioner against owners of any sewage, garbage or refuse disposal system which investigation shows to be creating a nuisance detrimental to public health. This article also provides the authority, under the due process of law, for fining any offender failing to comply with an order of correction, the fine being not less than ten dollars nor more than one hundred dollars.

(3) Chapter 16, Article 9, Sections 2 and 3 (Public Health Laws)

Sections 2 and 3 provide that anyone who knowingly and willfully throws or causes to be thrown any dead animal carcass or part thereof, the offals from any slaughter house, or any spoiled meat or fish, or the contents of any privy vault, or any putrid, nauseous or offensive substance into any stream, well, spring, or cistern, or upon the surface of any road, street, city or town lot, or within one hundred feet of a public road, shall be guilty of a misdemeanor.

Section 2 provides that anyone contaminating any source of domestic water supply in the above mentioned manner shall be guilty of a misdemeanor and, upon conviction, shall be fined not less than five nor more than one hundred dollars. Moreover, such offender shall be liable to the party injured in a civil action for damages.

Section 3 provides that anyone polluting any stream in the above mentioned manner or dumping offals upon any land or street, as already outlined, shall correct said nuisance conditions within 24 hours after notice thereof in writing from the health officer of the county or from the health officer or mayor of the municipal corporation. Failure to comply with such a written notice shall constitute a misdemeanor. Upon conviction for any such offense, the accused shall, within 24 hours, correct said nuisance conditions or his negligence shall be regarded as a second offense. Furthermore, every like neglect of 24 hours thereafter shall constitute an additional offense against this section.

A justice of the peace shall have jurisdiction over any offense against Section 3 committed within his county. The accused, upon conviction for a single offense, shall be fined not less than five nor more than one hundred dollars.

(4) Chapter 20, Article 6, Section 6 (Conservation Laws Pertaining to Pollution)

It shall be unlawful for any person or agency to discharge or cause to enter any water course in the state sawdust or other material deleterious to the propagation of fish life. It shall be lawful, however, in accordance with the mine laws of this state (Chapter 22, Article 2, Section 79) for the owner or operator of a coal mine or coal washery to discharge mine water resulting from such operation if said water is in a sanitary condition and free from human and animal pollution. Section 6 makes it unlawful for a mine owner having one convenient and sufficient outlet for water into one stream to cause the same to be drained into any other stream. Any person or agency violating the provisions of this section shall be guilty of a misdemeanor and, upon conviction thereof, shall be fined not less than ten nor more than one hundred dollars.

(5) Chapter 22, Article 2, Section 79a

This law provides that no one shall reopen an old or abandoned mine for any purpose whatsoever without first giving the Director of Conservation ten days notice thereof in writing. Upon receipt of such notice, the Conservation Commission shall send a representative to the mine to supervise any discharge of water necessary. Any one failing to give notice as prescribed in this bill shall be guilty of a misdemeanor and, upon conviction thereof,

shall be fined not less than five hundred dollars nor more than five thousand dollars.

Recommended amendments to Laws

1. It is suggested that under Chapter 16, Article 11, Section 5, of the State Water Commission Act that the following clause at the end of the section be deleted:

> "Provided, however, that such Commission shall not institute proceedings against any person engaged in the mining of coal and draining mines in compliance with existing law."

2. It is further suggested that Chapter 20, Article 6, Section 6, of the Conservation Laws be rewritten to make it a misdemeanor for any mine owner or operator to discharge any drainage of an offensive nature into West Virginia streams.

Pollution in Interstate Streams

Since the largest river in West Virginia as well as some of the lesser streams flow through states other than West Virginia, the problem of interstate pollution control becomes important. Consequently, it would not be sound policy for West Virginia to undertake an extensive clean up program on the Ohio River, for example, until the riparian states upstream have at least expressed a willingness to attempt such a program also.

From years of experience with interstate pollution, most of the states have apparently agreed that interstate compacts offer the most promising solution to this problem. The type of compact which seems to operate most effectively is one which empowers the appropriate state authorities to take immediate action on any project jointly agreed upon by representatives of all states concerned without further approval of their respective legislatures. The Delaware Basin Reciprocal Agreement, adopted in 1936, is an example of this type of cooperative effort, as indicated by the following description[1]. "Rapid strides toward pollution abatement in an interstate area have been taken in the Delaware Basin under the leadership of the Interstate Commission on the Delaware Basin. This group is composed of legislative and administrative members from Delaware, New Jersey, New York, and Pennsylvania, appointed under provisions of state legislation establishing commissions on interstate cooperation. As a part of its program for the development of the Delaware Basin 'Incodel' (an abbreviation of the formal title Interstate Commission on the Delaware Basin) has brought about agreement on standards of quality and on a schedule of needed construction by municipalities.

"The commission and the responsible administrative agencies in the four states have ratified a classification of the waters of the basin. It is the commission's opinion that further or additional pollution of the waters of the river is definitely prevented by the terms of the reciprocal agreement. New municipal sewerage systems must in future produce an effluent at least equal to the minimum requirements, and any new industry locating in the basin will be forced to comply with the adopted standards of waste treatment.

"A tentative program for completion of all needed municipal sewage treatment within 8 years is set forth in the adopted construction schedule. The schedule establishes minimum requirements for sewage treatment in each municipality now discharging domestic waste into the river, and sets a date for completion of the work necessary to meet those standards. A similar schedule is in preparation for sources of industrial waste.

"Enforcement activities of the respective state health departments have been stimulated, public attention has been directed at pollution problems in the area, state legislation providing for sewer rental in Pennsylvania has been sponsored successfully, and two special districts (the Central Delaware County Authority and the Darby Creek Joint Authority) have been created to make possible the financing of recommended work. In the case of Philadelphia, the major offender in the basin, the Pennsylvania State Sanitary Water Board has initiated legal action in an attempt to force the city to treat the sewage, most of which is discharged into the river without treatment.

"Without entering into formal compact, the states concerned have renewed their efforts to clean up the Delaware . . . . "

There are two rivers bordering West Virginia for which compacts are now under consideration. The Potomac River Agreement is the older of the two. An engineer and stenographic assistance have been employed under the authority granted by this compact. It is understood, however, that Pennsylvania has not signed the agreement. The other interstate agreement is for the Ohio Basin. Most of the signatory states have already ratified this compact; however, West Virginia and Ohio did so contingent upon a similar move by Pennsylvania which to date has taken no definite action. The failure of Pennsylvania, a key state in the basin, to ratify the compact has been sufficient to stalemate all action under this agreement. Continued failure by Pennsylvania to ratify and actively support the compact may warrant and necessitate Federal action.

The United States Public Health Service from time to time makes pollution studies of interstate streams in cooperation with riparian states. The recently completed Ohio River pollution survey which yielded much valuable data is an example of this type of study.[2]

Present Stream Pollution Control Program

The present stream pollution control program is being carried out under the direction of the State Water Commission which was discussed above in the section dealing with stream pollution laws. As previously indicated, the State Water Commission

[1] WATER POLLUTION IN THE UNITED STATES. Third Report of the Special Advisory Committee on Water Pollution, pp. 76-77. National Resources Committee, Washington, D. C., 1939.

[2] See also the recent report of the Sub-Committee on Mine Acid Control to the Upper Ohio-Beaver Basin Committee of the National Resources Planning Board.

Act provides a means whereby the directors of three of the state agencies most directly concerned with stream pollution may put into effect, by combined action through said Commission, any program of stream pollution control felt necessary. The program now in operation is being carried out with the assistance of the Division of Sanitary Engineering of the State Health Department. The Director of this Division serves as Secretary to the Water Commission and the Division has for the past year furnished a chemist to assist with the stream pollution control program.

Efforts so far in the pollution abatement program have been confined primarily to working with the major stream pollution offenders in the state to correct the more serious sources of both domestic and industrial pollution. All the tanneries in the state now have primary treatment systems in operation, and the daily operating efficiencies of these systems are reported to the Water Commission on monthly report sheets. All the by-product coke plants in the state have installed dephenolizing equipment, and the daily operating efficiencies of the equipment are reported to the Commission on weekly report forms. However, there are two tar processing plants in the state from which the phenols are not recovered before the wastes are discharged into the streams. In addition the engineer for the Commission visits these plants periodically to collect effluent samples for checking operating efficiencies and to recommend improvements. Likewise, all other industries in the state discharging objectionable effluents are inspected from time to time and recommendations for improvement are made to the respective managements.

During the last three years, the Commission has devoted considerable time and energy to reducing industrial pollution in the Charleston area, the most highly industrialized area in the state. This work has resulted in one plant installing a $125,000 recirculation system to keep its worst effluent out of the river. Another plant has combined its three effluents into a single discharge, thus bringing about a marked reduction in the oxygen demand and hydrogen sulfide content of the combined effluent over the original individual discharges. Still another plant has on order desulphurizing equipment which will remove the hydrogen sulfide from this industrial effluent. An oil refinery has constructed collection lagoons to allow controlled discharge of the phenol wastes from this industry. One of the other plants in this area has set up a stream pollution laboratory for the purpose of working with the state in correcting pollution problems. A Viscose plant with seven out-falls is considering combining the plant discharges into one and installing an automatic recorder and composite sampler upon the combined discharge in order that a complete effluent picture may be obtained. All these improvements have been accomplished by cooperative means indicating that industry is ready to reduce stream pollution just as rapidly as consulting service can be obtained to point out the best methods for solving these pollution problems.

It is believed that slightly more emphasis has been placed in recent years on industrial than on domestic stream pollution control. The treatment of domestic sewage prior to discharging same into the water courses of the state is also a vital consideration in any program of stream purification. Since state laws are adequate to compel offending municipalities to correct serious stream pollution, it is felt that more effort should be made in any expansion of the program to require, if necessary, such municipalities to provide adequate treatment for domestic sewage.

As an indication of its willingness to help the municipalities of the state correct their own domestic pollution, the State Water Commission sponsored sewage surveys of Martinsburg, Clarksburg and Weston. These surveys were ordered because it was felt the streams in these areas were so badly polluted that steps should be taken at once to correct the condition. All three surveys have been completed and the reports thereon presented to the Commission. The municipalities were ordered to appear before the State Water Commission to show cause, if any, why measures should not be taken to correct the pollution of the streams through the construction of sewage treatment plants. Due to the war and shortage of materials, a delay in construction of the plants has been granted; however, these cities were instructed to prepare plans and all other essential information in anticipation of construction of the plants following the war.

The fore-going outline is perhaps sufficient to give some idea of the work being done and serves to indicate that the enabling laws permit control of stream pollution in West Virginia, with the exception of mine drainage. For the past ten years the Commission has carried out a program of stream pollution control which has been limited by lack of appropriations. In spite of this, however, the program has been aggressive enough to enlist the interest of many municipalities and industries in correcting stream pollution. It has also intimately acquainted the pollution-control personnel with the needs in this field in West Virginia.

Funds and Personnel

The actual field, survey, laboratory and consulting phases of the work necessary to prosecute the present program are being carried out by one Chemical Engineer and one Chemist. The U. S. Public Health Service has aided the West Virginia pollution control program from time to time by loaning technicians to assist in making special studies. In some cases industries and municipalities have been sufficiently interested in projects to assign men to aid in completing the work.

At present the necessary laboratory work is being done in a fairly adequate laboratory used jointly by the survey personnel and the Bureau of Industrial Hygiene.

The State Water Commission has a budget of $4,300 per year which is used to pay the salary and travel of the Chemical Engineer. The Division of Sanitary Engineering of the State Health Department contributes approximately $3,000 per year to

the program which amount is used to pay the salary and travel of the Chemist and cover some of the laboratory needs.

Present Condition of West Virginia Streams

In order to give some idea of present stream conditions in the state, a rough classification based upon partial analyses and familiarity with the streams has been prepared as shown in Table III. The streams have been classified from the standpoint of their suitability for water supply, fish life, and recreational use.

Table III

Rough Stream Classification Based on Familiarity with Streams and Partial Analyses

Stream	* Class A	Class B	Class C
		OHIO BASIN	
Ohio Proper		Point of entrance to Wheeling 50 miles	Wheeling to Ravenswood about 135 miles
		Ravenswood to mouth Guyandot River 70 miles	Mouth Guyandot just above Huntington to State line about 20 miles
		KANAWHA BASIN	
Kanawha Proper	Gauley Bridge to Belle 30 miles	St. Albans to Point Pleasant about 45 miles	Belle to St. Albans about 23 miles
New River	Virginia line to Gauley Bridge		
Bluestone		Spanishburg to mouth at True	Bluefield to Spanishburg
Greenbrier	Source to Durbin 25 miles	Durbin to Cass 14 miles	
	Remainder of River with exception of two stretches listed under Class B about 110 miles	Marlinton to Seebert	
Gauley River	Source to confluence with Cherry River	Confluence to Summersville	
	Summersville to mouth		
Cherry River	Source to Richwood		Richwood to mouth
Elk River	Source to Clendenin 140 miles	Clendenin to mouth 20 miles	
Coal River	Source to mouth with exception of few stretches affected by coal washeries		
Pocatalico River	Source to mouth		
		MONONGAHELA BASIN	
Monongahela Proper		Fairmont to Morgantown 30 miles	Morgantown to State line 10 miles
West Fork River	Source to Weston 20 miles	Weston to Clarksburg 35 miles	Clarksburg to Fairmont 35 miles
Tygart River	Source to Elkins	Belington to Reservoir 30 miles	Elkins to Belington 15 miles
Middle Fork River	Source to mouth except for short areas 30 miles		

MONONGAHELA BASIN — Continued

Stream	* Class A	Class B	Class C
Buckhannon River	Source to Buckhannon 40 miles	Buckhannon to mouth 20 miles	
Cheat Proper		Parsons to State line 80 miles	
Shavers Fork	Source to Parsons 70 miles		
Dry Fork River	Source to Hendricks 15 miles	Hendricks to Parsons 4 miles	
Blackwater River		Source to Thomas 20 miles	Thomas to mouth 10 miles

LITTLE KANAWHA BASIN

Little Kanawha	Source to Lock No. 1 above Parkersburg except for short stretches 120 miles	10-mile stretches below Burnsville, Glenville, Grantsville	Lock No. 1 to mouth 4 miles
Hughes River		Source to mouth	

GUYANDOT BASIN

Guyandot Proper	Source to Logan except Class B Chapmansville to Barboursville 65 miles	Mullens to Baileysville 25 miles	Logan to Chapmansville 10 miles, Barboursville to mouth 5 miles
Mud River	Source to mouth except short sections 50 miles		

BIG SANDY BASIN

Big Sandy Proper	Hubbardstown to 3 miles above mouth, 16 miles	Fort Gay to Hubbardstown 10 miles	
Tug Fork	Source to mouth with exception of those stretches listed in Class B 140 miles	3 miles above mouth to mouth, from Iaeger to point 5 miles below Williamson to Naugatuck 15 miles	
Dry Fork	Source to War	Avondale to Iaeger	War to Avondale

POTOMAC BASIN

Potomac Proper	Williamsport to Harpers Ferry	Old Town to Williamsport	
North Branch	Source to Westernport		Westernport to Old Town
South Branch	Source to mouth except stretches under B	Petersburg to Old Fields	
Cacapon River	Source to mouth		

* Class A—Good source of water supply; good fish habitat and recreational water.
Class B—Serve as source of water supply with complete treatment; fair fish habitat and recreational water.
Class C—Unsatisfactory source of water supply; unsuitable as fish habitat and recreational water.

Need for an Expanded Stream Pollution Control Program in West Virginia

The streams of West Virginia, once of crystalline purity but in some sections now showing much evidence of contamination, are one of the state's most valuable natural resources. As indicated in Table III the Ohio, Monongahela, Kanawha and sections of other rivers are badly polluted. This pollution, unless carefully controlled, will continue to increase with growing populations and expanded industrial programs. Moreover, the increase in stream contamination presents a grave supply problem since some of the plants using surface supplies are treating water which challenges all the means now available to produce a safe, potable water.

Table IV was prepared to present a picture of approximately what it would cost municipalities and industries of the state to reduce stream pollution to an acceptable minimum in the major water courses. The total cost of treatment in West Virginia represents a large amount of money, but it would not be expended as a lump sum. The major offenders should be required to correct their pollution first and the minor offenders made to follow immediately.

The total cost of treatment is of interest to the state, but raising funds for a correction program is not the function or responsibility of the state government. On the other hand, it is very definitely the function of the state to provide adequate funds and personnel to support the survey and consulting work necessary to show the municipalities and industries the need for and cost of reducing stream pollution to an acceptable minimum so that remedial projects can be inaugurated.

By using stream pollution correction estimates prepared by the United States Public Health Service and supplementing these figures with information garnered from experience, the rough cost picture listed in Table IV was prepared. These basin totals were arrived at by using cost of complete treatment in towns where this is necessary and only partial treatment in other places where such is adequate to correct the pollution.

To get an accurate picture of West Virginia streams, a complete classification by analyses of the major streams of the state should be made as indicated in Table V. The latter was worked out along lines similar to a classification table used by the U. S. Public Health Service. When such classifications have been completed, the results should be plotted on a water shed map of the state so that stream conditions would be readily visible. Then after a complete classification had been finished, any stream could be checked at future dates to determine whether it was getting better or worse. It further seems advisable that every effort should be made to complete this stream classification as soon as possible so that basic data would be available.

In addition to classification surveys, it will also be necessary to make many industrial and domestic studies (a) to show individual industries and municipalities the types of construction and treatment required to correct most effectively their particular stream pollution problems, and (b) as a basis for outlining compulsory action if such becomes necessary.

The problem of stream pollution abatement is also of much concern to the sportsman and nature lover. As evidence of the universal interest in this matter, the Izaak Walton League of America at its 21st Annual Convention, March 27, 1943, unanimously adopted the following resolutions:

Protecting Public Water Values

"WHEREAS, in the name of public water conservation, existing aquatic values and the public's right to their enjoyment have been commonly ignored in the development of new values in large dam construction programs at varience with the plain intent and spirit of the Coordination Act, therefore

"BE IT RESOLVED: that we oppose any further authorizations or appropriations for engineering surveys or resurveys of our inland waters unless such surveys include aquatic biologists and other scientists on an equal basis with the engineers assuring that all values be given adequate consideration and that the reports of such surveys be made public."

In support of this resolution the League goes on to state, "we believe it is time to call a halt on the blind engineering to large dam construction which ignores public aquatic values, and that the place to start is on these preliminary surveys which frequently prove to be an entering wedge. Incidentally, the principle embodied in this resolution has been heartily endorsed by all recognized conservation organizations."

There is an increasing opposition to calling scientists in on a post mortem, and a growing demand that they have an equal place with the engineers in the pre-planning stages.

Water Pollution

"WHEREAS, the methods of satisfactory treatment for municipal sewage have long been well known, and

"WHEREAS, many municipalities pleading a lack of funds, have failed to accord proper, and in many cases, any treatment of municipal sewage, while at the same time accepting under various public works plans over a period of years, federal funds far in excess of those needed for SEWAGE treatment, applying them to less essential or luxury projects, while leaving their own sewage problems unsolved as a menace to public health and a menace to downstream communities, therefore

"BE IT RESOLVED: that in our planning for any post-war public works program that the following principle be adopted with respect to all municipal works and all public institutions involving federal or state participation or aid;

Table IV

Cost Estimate for Necessary Sewage Treatment

	Capital Cost	Annual Charges
OHIO BASIN		
Industrial	$ 1,200,000	$ 85,000
Domestic	7,450,000	600,000
Total	$ 8,650,000	$685,000
KANAWHA BASIN		
Industrial	$ 2,500,000	$100,000
Domestic	5,000,000	415,000
Total	$ 7,500,000	$515,000
MONONGAHELA BASIN		
Industrial	$ 600,000	$ 60,000
Domestic	4,500,000	400,000
Total	$ 5,100,000	$460,000
LITTLE KANAWHA BASIN		
Industrial	$ 150,000	$ 25,000
Domestic	300,000	30,000
Total	$ 450,000	$ 55,000
GUYANDOT BASIN		
*		
Domestic	$ 530,000	$ 47,000
Total	$ 530,000	$ 47,000
BIG SANDY BASIN		
*		
Domestic	$ 900,000	$ 70,000
Total	$ 900,000	$ 70,000
POTOMAC BASIN		
Industrial	$ 300,000	$ 40,000
Domestic	922,000	72,000
Total	$ 1,222,000	$112,000
Grand Total	$24,353,000	$1,944,000

Table V

Proposed Classification for West Virginia Streams

		CLASS A Good Source of Water Supply; Good Fish Habitat and Recreational Water	CLASS B Serve as Source of Water Supply with Complete Treatment; Fair Fish Habitat and Recreational Water	CLASS C Unsatisfactory Source of Water Supply; Unsuitable as Fish Habitat and Recreational Water
Indicated Number Coliform Bacteria Per ml.**	Average	(Water Supply) Not over 50 in any month	50–200 in any month	Over 200 in any month
Indicated Number Coliform Bacteria Per ml.	Average	(Bathing Purposes) Not over 1.0	1.0–10.0	Over 10.0
Dissolved Oxygen p. p. m.	Average Minimum	Not less than 6.0 in any month. Not less than 5.0 on any day.	5.0–6.0 in any month 3.0–5.0 on any day	Less than 5.0 in any mo. Less than 3.0 in any day
5 Day b. o. d.	Average	Not over 2.0 in any mo.	2.0–5.0 in any month	Over 5.0 in any month.
pH	Average	5.8–9.0	3.8–5.8 or over 9.0	Less than 3.8 or over 9.5
Phenols p. p. b.	Average	Not over 1.0	1–15	Over 15
Industrial or Domestic Sludge Deposits		No deposits present	Slight to moderate–Localized	Moderate to heavy–General
Iron p. p. m.	Average	Not over 0.5	0.6 to 8	Over 8
Other Conditions		No toxic substances, oils, tars, or free acid at any time; no floating solids or debris, except from natural sources; only slight amounts of taste and odor producing substances occasionally present.	Free acidity at any time; chlorides over 250 p.p.m.; taste and odor producing substances present frequently.	Toxic substances, oils or tars present at any time; free acidity present frequently; taste and odor producing substances always present.

* Industrial figures unavailable at this time.

** Key to abbreviations: ml—mililiter; p.p.m.—parts per million; b.o.d.—biochemical oxygen demand; pH—pH7 neutral, below pH7 acid, above pH7 alkaline; p.p.b.—parts per billion.

namely, that unless and until a municipality or public institution having a water sewer system either has adequate sewage treatment facilities or bona fide plans for acquiring such facilities, it shall not be eligible for federal or state funds for any other purpose."

In this connection the League points out, "we believe the recommendation embodied in this resolution on water pollution presents a new approach to this troublesome problem, which, if adopted, will do more to correct pollution than all that has been done in the past."

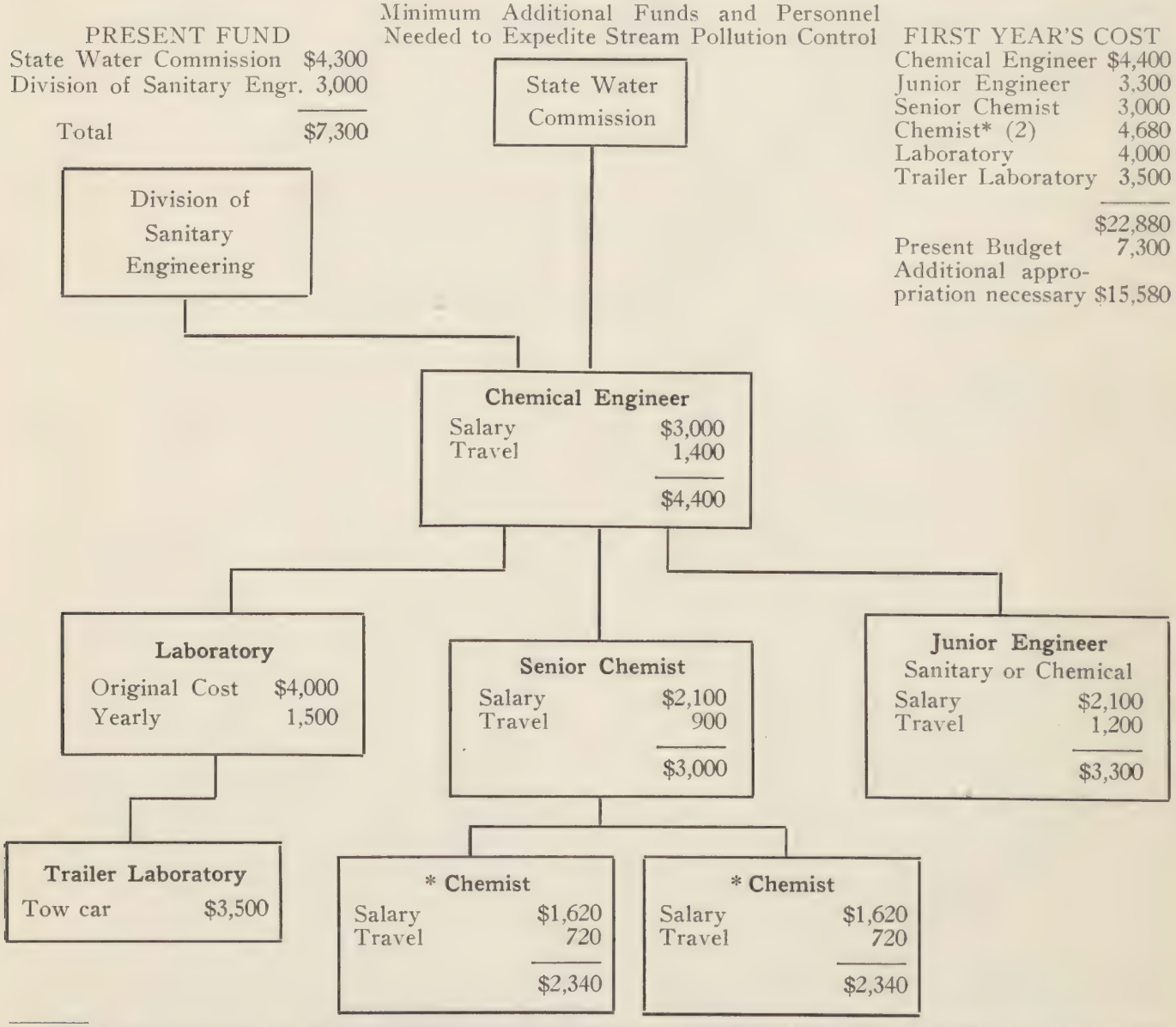
Perhaps for the time being we must reconcile ourselves to permitting our rivers to serve as large-scale sewage lines. But if we hope to go much further in industrial and agricultural development, in the improvement of public health conditions, and in capitalizing upon the potential wealth of our recreational resources, **our waters must be cleaned up.**[3]

Additional Funds and Personnel Needed

A major obstacle in the way of a more aggressive pollution control program in West Virginia, as mentioned earlier, is that sufficient funds and personnel are not available to make the program adequate. Only two men are now working on the program, but at least five should be as shown in Chart 1. As also indicated in this Chart, a laboratory should be equipped for stream pollution work alone, and a trailer laboratory provided for field surveys. It is apparent that to expand the present program in West Virginia into one adequate to cover the needs would require additional funds amounting to not less than $16,000 annually.

CHART 1

Minimum Additional Funds and Personnel Needed to Expedite Stream Pollution Control



[3] See THE IMPORTANCE OF WATER RESOURCES AS SEEN BY THE WEST VIRGINIA STATE PLANNING BOARD. The West Virginia Engineer, Vol. 5, No. 3, March 1943, pp. 10-11.

* The magnitude and importance of the work require the full-time services of at least two chemists.

It is believed that the program of stream pollution control in the state could be furthered by providing funds for research work. The Agricultural Experiment Station is engaged already in studies of pollution abatement, and the facilities of the Engineering Experiment Station at West Virginia University also could well be used in cooperation with the Water Commission to carry out vital stream pollution research if funds were provided for this purpose.

In Urban Sewage Disposal

In West Virginia nearly all the sewered cities and villages discharge their municipal sewage directly into adjacent streams. In many cases the sewage collects during dry seasons in stagnant pools in the stream beds, sometimes causing malifferous odors, and always accompanied by the danger of spreading disease in the locality of the stinking pools; or when more water is available in the river bed, the partially purified sewage is carried along to be used, after more or less effective treatment, as drinking water in downstream cities. In other cases there may be adequate water during low flow to receive the sewage without creating a nuisance condition, but in these cases, as well, there is danger to the downstream water plants and to persons seeking recreation in addition to creating an esthetic problem. In some of our streams acid mine drainage acts as a preservative of the sewage and retards for a time the decomposition and putrifaction of the organic portions of the sewage. However, when the acid water is diluted and neutralized by non-acid streams or rainfall run-off, the decomposition and putrifaction becomes active again.

Table VI shows the towns in West Virginia that are served by some type of sewage treatment.

State Laws

Control over methods of sewage disposal is vested in the State Health Department by Chapter 16, Article 1, Section 7, while the authority to require abatement of stream pollution is vested in the State Water Commission as previously explained on pages 2 to 4.

Progress and Difficulties

The population served by sewage treatment processes increased from 2,500 in 1920 to 77,752 in 1942. The greatest increase was after 1930 when Federal aid projects accelerated the program. Until the war is over and materials are again available, very little work is anticipated.

Sewage treatment plant design in West Virginia remained stable until 1941. The standard primary treatment has been Imhoff and septic tanks with trickling filters or subsurface absorption as secondary treatment. There have been several sludge digestion plants designed since 1940 and one activated sludge plant. Mechanical equipment is beginning to appear in the designs. More efficient treatment is obtained in these modern type plants.

Two of the things that have curtailed construction of new sewage treatment plants were both caused by the war and probably cannot be corrected until it is over. They are priorities and the curtailment of Federal aid. Without materials it is impossible to construct plants, and without outside assistance the majority of our municipalities cannot finance the correction of stream pollution. We have an enabling act that permits local sanitary boards to issue revenue bonds for sewerage construction and provides for their retirement and plant operation by authorizing the collection of regular service fees. However, these fees are exorbitant in the majority of cases when Federal aid is not available for construction.

Table VI

SEWAGE TREATMENT IN WEST VIRGINIA MUNICIPALITIES

Community	Population 1940	Population Served	Sewage Treatment*	Discharge to
Arthurdale	—	266	CsIs (2 plants)	Deckers Creek
Athens	682	550	CsIs (3 plants)	Ravines
Beckley No. 1	12,852	5,400	ShGCiEcBc	Little White Stick Cr.
Beckley No. 2	—	8,100	ShGCiEcBc	Piney River
Benbush	200	100	CsIs	Soil
Bluefield No. 1	20,641	4,500	ShCiFtnEgCmBc	East River
Bluefield No. 2	—	15,000	SmCiFtnEgcBc	Bluestone River
Burnwell	318	60	Cs	Paint Creek
Caretta	—	2,700	Cs (5 plants)	Barrenshe Cr.
Charles Town	2,926	1,500	ShCiBo	Evitts Creek
Chattaroy	526	400	Cs (40 plants)	Buffalo Creek
Cinderella	200	150	Cs (3 plants)	Sycamore Creek
Dakota	—	275	Cs (21 plants)	Monongahela River
Decota	500	60	Cs (12 tanks)	Cabin Creek
Dehue	—	50	Cs	Rum Cr.
Diamond	650	200	Cs (many tanks)	Kanawha River
East Beckley	410	410	—	Beckley Plant
Fayetteville	1,347	700	Cs (2 plants)	Marr Creek

* Symbols defined on page 13.

Community	Population 1940	Population Served	Sewage Treatment	Discharge to
Fort Gay	645	100	CsIs (2 plants)	Soil
Hamlin	850	850	Cs	Mud River
Harrisville	1,338	900	Cs	Back Run and N. Fork, Hughes River
High Coal	250	60	Cs	Seng Cr.
Hurricane	1,103	900	CiBo	Hurricane Cr.
Kingston	1,500	60	Cs	Milburn Cr.
Kingwood	1,676	U.C.	Ci and Cs	Greens Cr. and Indian Cr.
Kopperston	—	100	Cs (3 tanks)	—
Mabscott	1,473	750	—	Beckley Plant No. 2
Mammoth	1,500	50	Cs	Kelleys Creek
Marfork	600	70	Cs	Little Marsh Fork
Martinsburg	15,063	5,000	ShCiFtnCpBo	Tuscarora Cr.
Masontown	869	25	Cs	Deckers Cr.
Monongah	1,790	1,000	Cs	West Fork
Nellis	150	300	CsIs	Ground
New Cumberland	2,098	240	Cs	Ohio R.
Oak Hill	3,213	3,000	EgCiBo	Arbuckle Cr.
Paw Paw	990	U.C.	ShCiEgcBo	Potomac R.
Pennsboro	1,738	1,400	Ci	Bunnel Run
Pratt	417	25	CsIs	Kanawha R.
Raleigh	500	250	—	Beckley No. 2 Plant
Reedsville	324	125	CsIs (4 plants)	Deckers Cr.
Richard	—	250	Cs (25 plants)	Deckers Cr.
Romney	2,013	1,500	ShCiFtnEgcCpBo	Big Run
Sharples	450	150	CsIs (8 plants)	Ground
—		250	Cs (12 plants)	Spruce Fk.
Sophia	1,160	300	CsIu	Soak Cr.
South Charleston	10,377	800	CiBo	Joplin Branch
Spencer	2,497	*3,000	GhScCiFtnCEcBo	Spring Cr.
Summersville	643	540	Ci	Arbuckle Cr.
Tygart Valley Homesteads	1,200	1,200	CiEcBo (3 plants)	Tygart R.
Union	346	346	CsEh	Limestone Caves
Vienna	2,338	U.C.	Ci	Ohio River
Wayne	801	400	Cs (2 plants)	Twelvepole Cr.
West Liberty	420	140	Cs	Short Cr.
Wharton	—	600	Cs (20 plants)	Pond Fk.
** White Sulphur Springs	2,093	**2,800	CiEBo	Howards Cr.
55		67,902		
INSTITUTION AND SEMI-PUBLIC				
Alderson Federal Women's Industrial Institution		715	CsBo	Greenbrier River
Denmar Sanitarium		115	CsIu	Greenbrier River
Fairmont—Westinghouse		300	CiBc	Monongahela R.
Hopemont Sanitarium		U.C.	ScCpAmEgDpcBo	—
Huttonsville—Medium Sec. Prison		300	CiEBo	Tygart R.
Jacksons Mill—4-H Camp		500	CiEcg	West Fork R.
Morgantown—du Pont Plant		600	CpEgDfBo	Monongahela R.
Roneys Point—Co. Farm and San.		200	CiFthECBo	Dixon Run
Saint Albans—Naval Ordnance		1100	CmDpcBc	Kanawha R.
Sweet Springs—Sanitarium		200	CsIuEh	—
Weston—State Hospital		2,000	ShCiFtnCpEBo	Polk Cr.
11		9,850		
Total population served by sewage treatment plants		77,752		

* Includes State Hospital
** Includes Greenbrier Hotel

Treatment units are denoted by letter symbols. Capitalized letters denote major treatment units; lower case letters denote characteristics of the major units which they follow. In general, sewage treatment units are noted in the order of sewage flow with sludge treatment unit symbols following thereafter. Where chlorination forms a part of the treatment, this has been noted only one time at each such plant whether or not dosage may be or is practiced at more than one point in the treatment process.

Treatment or device	Symbol
Screens	S
—bar, or other coarse type, hand cleaned	Sh
—bar, mechanically cleaned	Sm
—comminutor	Sc
Settling tanks	C
—plain, hopper bottom	Cp
—septic tank	Cs
—two-story tank	Ci
—mechanically equipped	Cm
Trickling filters	Ft
Sewage application to land	I
—sub-surface application	Is
—land underdrained	Iu
Activated sludge aeration	A
—mechanical aeration	Am
Chlorination	E
—hypochlorite	Eh
—chlorine gas	Eg
Separate sludge digesters	D
—unheated	Dp
—with floating cover	Df
—with fixed cover	Dc
Sludge beds	B
—open	Bo
—glass covered	Bc

A third difficulty, as previously pointed out, is the inability thus far to establish effective interstate compacts to control pollution on such streams as the Ohio and Potomac. After several years of negotiation involving considerable time and expense, it remains questionable whether all the states involved will reach a joint agreement which will permit and activate the control of interstate stream pollution. Perhaps other measures will be required to handle this problem which is and has been serious for many years.

The operation of sewage treatment plants is not entirely satisfactory. Operators are not licensed and in some cases are not capable. Moreover when city administrators change, there is always a possibility that an experienced man will be replaced by an incapable political appointee.

The maintenance of sewerage systems beyond municipal corporation limits is a serious problem. These sewers are usually of doubtful ownership and sanitary inspectors have a difficult time obtaining correction of broken and clogged sewers. The origin of most of this trouble is the construction of sewers without approval from the State Health Department. Real estate developers are particularly guilty of this.

Needed Improvements

(1) Where states are unable to agree upon interstate compacts to control effectively interstate stream pollution, the Federal Government should be encouraged to pass legislation to control such pollution. It is doubtful whether interstate pacts alone will solve the pollution problems in streams such as the Ohio and Potomac. Not only should legislation governing the pollution of streams be encouraged, but also funds should be created to aid municipalities and other public bodies in financing the costs of sewage systems and sewage treatment plants.

(2) An intensive program of stream studies is needed to enable the State Water Commission and State Health Department to distinguish degrees of stream pollution as a basis for developing plans and, if necessary, outlining compulsory action.

(3) Municipalities must take advantage of the law which permits them to extend their sewerage system at least ten miles beyond the city limits to serve a considerably greater portion of our suburban areas. It is apparent that the law regarding the collection of fees beyond the municipal corporation for sewer services is not very strong, and it may be advisable to amend the law to grant the city specific authority under this subject.

(4) Increased activity in public health education and publicity regarding the treatment of sewage is badly needed. It is not very feasible to ask citizens to construct sewage treatment plants without giving proper information to the govern-

ing bodies and the citizens, as they will likely reject such proposal because of a feeling that this increased cost has been forced on them without reason.

(5) Considerably more attention should be given to the instruction of sewage plant operators. Courses in cooperation with West Virginia University and the West Virginia Public Health Training Center would be a great aid in improving sewage plant operation. The West Virginia Public Health Council, as authorized by statutory law, should pass a regulation requiring the licensing of all sewage plant operators.

(6) It is suggested that the Legislature pass an act requiring the county clerks to refuse real estate plats that do not have an approval by the State Health Department of the method of sewerage, sewage disposal and water supply.

Effect of Improvements

If the above suggestions were followed, great strides could be made in the construction and operation of sewage treatment plants in West Virginia. Federal legislation controlling stream pollution would eliminate the problem along the Ohio River, where cities like Wheeling, Moundsville, Parkersburg and others refuse to consider sewage treatment until the city of Pittsburgh and industrial plants in Pennsylvania have taken definite steps to correct their pollution.

Federal aid, as shown through the last decade when the Works Progress Administration, Public Works Administration, and other Federal agencies, aided municipalities in constructing sewage treatment plants, gives a great impetus to the program. Sewage treatment unquestionably is expensive and something that people have not had to finance in the past when they discharged their sewage directly to the streams. With Federal aid the construction costs are reduced to an amount which normally is not objectionable to conscientious citizens.

The classification of streams would permit the governing bodies to place improvement on a more scientific basis and would enable them to justify the abatement of pollution in specific cases. The degree of treatment needed could very easily be determined by such a classification without the necessity for making a specific investigation of each case.

The instruction and licensing of sewage plant operators would have far-reaching results. Sewage plants would be operated more efficiently and streams would, therefore, be kept in better condition. Maintenance could be established under responsible heads, and changes in municipal administration would not mean that an unqualified and irresponsible person would suddenly be placed in charge of a sewage treatment plant.

The final result of these improvements would be a greatly decreased pollution load on water plants, improved recreational facilities, and the reduction of serious public health hazards.

In Sanitation

The West Virginia Milk Program

Milk control work in the state is based on a regulation adopted by the W. Va. Public Health Council which is enforced in areas having adequate health department services. This regulation is in conformance with the U. S. Public Health Service Milk Ordinance of 1939 and was originally adopted in West Virginia in 1928, readopted and brought up-to-date each time important changes have been made in the Public Health Service Ordinance.

West Virginia is lending its support to a nationwide effort of the United States Public Health Service and Department of Agriculture to have each state in the union adopt the Standard Ordinance and Code. Many cities and counties bordering West Virginia in the states of Virginia, Maryland, Kentucky, and Ohio operate under the Standard Ordinance and Code. Reciprocal inspections are practiced between West Virginia and many of our neighbors resulting in good will, in a saving of money spent for inspection service, and in less duplication of inspection.

Every effort is being made by the State Department of Health to treat all dairymen fairly in the enforcement of the ordinance. To this end an Advisory Board consisting of six members was established in 1940 to advise and work with the West Virginia Department of Health. This Advisory Board, which meets twice a year, is composed of representatives of the retail "raw" dairymen, "raw-to-plant" dairymen, pasteurization plants, State Department of Agriculture, Dairy Department of West Virginia University, and the State Health Department.

All retail "raw" and "raw-to-plant" dairies in West Virginia are inspected by local sanitarians, and inspection sheets are posted in each dairyman's milk house. Similarly, a member of the State Health Department inspects all pasteurization plants and leaves copies of his inspection sheets. In addition all pasteurization plants are required to be inspected once each month by the local sanitarian and a copy of the inspection sheet sent to the State Health Department.

Each year sample studies are made in as many sections of West Virginia as time will permit. Any cities or counties making a rating of 90 percent or above are placed on the honor roll in the "Public Health Reports", a booklet published semi-annually by the U. S. Public Health Service. These cross-section surveys are made by a member of the State Health Department and, whenever possible, by a milk specialist from the United States Public Health Service.

For the most part only counties or districts that have full-time health departments enjoy the benefits of milk inspection. As of April 1, 1943, milk grades were regularly announced in 40 of the 55 counties, which represent 84 percent of the total population of the state. In addition milk grades were also regularly announced in three cities located

in three different counties other than the 40 before mentioned. Thus in April 1943 a grand total of 88 percent of the state's population lived in areas where all the milk sold was graded.

As of April 1, 1943 the total number of retail dairies selling grade A raw milk[4] in West Virginia was 432; the number of grade C retail dairies selling grade C raw milk was 215; and the total number of "raw-to-plant" dairies selling grade A raw milk to be pasteurized was 2,296.

West Virginia is served by 89 pasteurization plants. Of these 70 are located in the state and 19 are located in surrounding states with the exception of Pennsylvania and Kentucky.

Eighty-four of these pasteurization plants are grade A; 5 are not graded. An effort is being made, however, to grade 2 of these 5 plants which will then leave 2 ungraded plants in counties that have no inspection at all and 1 at a federal institution.

As of January 1, 1943 the total of grade A pasteurized milk and milk products sold daily in the state was 45,587 gallons according to the State Department of Health records; the total of grade C pasteurized milk and milk products sold daily in the state is 150 gallons; and the total of pasteurized milk carrying no grade sold daily in the state is 690 gallons.

The total of grade A raw milk and milk products sold daily in the state is approximately 20,150 gallons. The total of grade C raw milk and milk products sold daily in the state is about 2,680 gallons.

There are no grade B pasteurization plants in West Virginia, and only 70 gallons of grade B raw milk are sold daily in the state.

A total of thirty-six counties either have full-time health departments, or are located in districts having full-time health departments; and there are a total of twenty-nine trained sanitarians doing milk work in these counties.

In addition to the State Laboratory there are twenty-six laboratories located in various counties throughout the state and nearby in surrounding states, making regular bacteriological tests on milk sold in West Virginia.

In a number of counties and cities the phosphatase test is run regularly on pasteurized milk.

It is the policy of the State Health Department that each county or district having a full-time health department institute a milk program, set a date to announce grades, and then periodically announce grades in conformity with the West Virginia Public Health Council regulations.

Looking over the progress of the milk sanitation program in West Virginia, particularly since 1936 when Social Security funds were first made available to expand the number of county and district units, the personnel of these units had, in the extensive drive for safe milk, reached a point by 1943 where milk grades were announced regularly in areas serving approximately 88 percent of the population of the state, as compared to 14.3 percent in 1930, 14.5 percent in 1936, 46 percent in 1938, 54 percent in 1940, and 63 percent in 1941.

The consumption of safe milk in West Virginia should be increased insofar as possible and at least to the extent of one pint per person per day.

It should be pointed out that the war has created many problems which will necessarily delay parts of the milk program. For example several sanitarians have joined the armed forces or accepted employment in war industries causing a curtailment in some of the activities previously carried on by these men. However, the Department of

[4] Grade A raw milk is raw milk which, by the plate-culture method, does not exceed for the last four consecutive samples a logarithmic average of 50,000 bacteria per cubic centimeter, and which is produced at dairy farms, that upon inspection by an authorized official, are found to conform with 26 specific items of sanitation including requirements that: cows be free from tuberculosis and other diseases which cause abnormal milk or may be transmitted to human beings; barns and milk houses meet minimum standards of lighting, ventilation, and general cleanliness including control of dust and the elimination of flies; every dairy farm shall be provided with one or more sanitary toilets conveniently located and properly constructed, operated and maintained, so that the waste is inaccessible to flies and does not pollute the surface soil or contaminate any water supply; water is of a safe, sanitary quality; all multi-use containers, equipment, and other utensils used in the handling, storage, or transportation of milk or milk products shall, between each usage, be subjected to an approved bactericidal process with steam, hot water, chlorine, or hot air; the udders and teats of all milking cows shall be clean and rinsed with a bactericidal solution at the time of milking, and the flanks, bellies, and tails of all milking cows shall be free from visible dirt also at that time; the personal sanitation and health of the milkers and milk handlers be maintained to the end that milkers' hands shall be clean, rinsed with a bactericidal solution, and dried with a clean towel immediately before milking and following any interruptions in the milking operation, that milkers and milk handlers shall wear clean outer garments while milking and handling milk, milk products, containers, utensils or equipment, and that a health officer, or a physician authorized by him, shall examine and take a careful morbidity history of every person connected with a retail "raw" dairy, or about to be employed, whose work brings him in contact with the production, handling, storage, or transportation of milk, milk products, containers, or equipment and if any such person is found to be a carrier of or infected with the organisms of any communicable diseases likely to be transmitted through milk, he shall be barred from such employment. Other miscellaneous requirements also provide, among other things, that vehicles used for the transportation of milk or milk products shall be so constructed and operated as to protect such milk and milk products from the sun and from contamination.
Grade B raw milk is raw milk which violates the bacterial standards for Grade A raw milk, but which conforms with all other requirements for grade A raw milk, and has an average bacterial plate count not exceeding 1,000,000 per cubic centimeter.
Grade C raw milk is raw milk which violates *any* of the requirements for grade B raw milk. This does not mean, however, that such milk is necessarily unsafe for human consumption.
Grade A pasteurized milk is grade A raw milk which has been properly pasteurized, cooled, and bottled in a milk plant which, upon frequent inspection by an authorized official, is found to conform strictly to a number of sanitary items similar to those listed for raw milk. The average bacterial plate count of grade A pasteurized milk shall at no time after pasteurization and until delivery exceed 30,000 bacteria per cubic centimeter. Failure to meet bacterial limits or sanitary requirements will result in such pasteurized milk receiving a lower grade or may even prohibit it from being sold.
For more detailed information consult MILK ORDINANCE AND CODE, Recommended by the United States Public Health Service, 1939; Public Health Bulletin No. 220, Federal Security Agency, U. S. Public Health Service, Washington, D. C.

Health is doing everything possible to keep the work of securing a safe milk supply active. No doubt this will become increasingly difficult as time goes on since trained men are required to do such work efficiently.

Another problem is that associated with the creation of defense areas where the population has increased rapidly making it difficult to secure inspected milk in sufficient quantities to meet the demand. At a recent meeting the Advisory Board went on record as permitting uninspected milk to be sold in such areas where inspected milk could not be obtained in sufficient quantity to supply the demand. Such uninspected milk can be brought into defense areas only under a permit from the Health Department, must be pasteurized and labeled non-inspected milk, and will be permitted only so long as the lack of inspected milk exists. The permit to distribute uninspected milk must be obtained through the Cooperative Milk Association in the cities which have this organization.

Food Handling Establishment Sanitation

The sanitation of food handling establishments is subject to regulations adopted by the Public Health Council of West Virginia. These regulations are revised from time to time as conditions warrant. For example, the Public Health Council in March 1942 adopted a new Food Handling Establishment Regulation which requires each establishment to meet certain physical requirements and compels the food handlers to attend a course of instruction before being given approval cards.

Today approximately 1,250,000, or nearly two-thirds, of the people in the state are living in areas in which the food establishment regulations are in force.

When this program was first started, an attempt was made through educational methods to gain the cooperation of those engaged in handling food. As a result, a few of the establishments became sanitation conscious. However, results being slow, a more vigorous attempt was made to have all establishments comply with the food handling regulations. Since then, rapidly increasing numbers of establishments have met all items of sanitation. These results, while in part due to a more forceful attitude of the sanitarians, may also be attributed to additional personnel being placed in some units which were overloaded with work.

After repeated inspections, those establishments found to be complying with each item of sanitation are issued an approval card by the local health officer. Not only must these establishments comply with all items of sanitation, but the utensils used in serving food must also meet established bacteriological standards.

The percentage of approval cards issued has been very small in comparison with the total number of establishments in business. It is the policy not to issue an approval card to any but the highest type of establishment.

Under regulation 6, issued by the State Tax Commissioner, only those establishments complying with certain items of sanitation, such as sterilization of glasses and sanitary toilet facilities, are permitted to sell beer. Failure to comply may result in revocation of the beer license. This regulation, while not strictly enforced, has resulted in better sanitation at these establishments. There is, however, room for much improvement.

To date no action has been taken in the state to obtain legislation specifically governing the operation of local slaughter houses. While general provisions governing the activities of the State Department of Health relate to the operation of these establishments, no aggressive action to check on the maintenance of adequate sanitary precautions has been taken so far. A growing public interest in the quality of meat and meat products consumed is likely to increase the demand for adequate regulation and control of local slaughter houses.

School Sanitation

It is the purpose of the State Health Department to render the physical environment of the school child as free from health defects as possible. The school sanitation program is designed to prevent disease and promote good health just as do the immunization, vaccination and physical examination programs. More specifically it is the aim to provide the following:

(1) A good ventilation system to insure even circulation of air and proper temperature.

(2) Proper lighting, both artificial and natural, to prevent eyestrain. This includes light colored walls and adjustable shades.

(3) Good seating arrangement to prevent the formation of poor posture habits, including adjustable-type desks and seats to allow for variations in size of pupils.

(4) A safe, protected water supply at each school to insure against water-borne diseases, and by good well structure, to demonstrate the importance of such protection to both pupils and patrons.

(5) Sanitary drinking and handwashing facilities since both are extremely important in preventing the spread of disease.

(6) Sanitary toilet facilities whether of the outdoor or indoor type.

(7) A school building in good repair, painted, and free from fire hazards along with safe playground equipment which will serve as a source of pride to the children and parents of each community.

At present the only item approaching satisfaction is that of sanitary toilet facilities. This is due to the fact that nearly all school boards have taken advantage of the Community Sanitation projects to build privies.

School boards in general have no definite plans for improvement, but rather seem to follow a hit or miss method depending upon the amount of pressure from each community. There are notable exceptions to this rule, but these are in the minority.

Unscreened doors and windows; unjacketed stoves; old double seats which hark back to the three-R days; green shades which eliminate all light when drawn; cross lighting, that is, windows on

both sides of the room; no electricity or inadequate when present; unpainted or darkly painted interiors; exteriors unpainted since construction; a shabby building in poor repair; water taken from a nearby open spring; rusted, dirty wash basins; open water pails; and dirty, open-top glasses kept in desks—all go to make up the typical picture of a very dreary, uninspiring, dangerous place in which to be subjected to the rigors of learning and teaching for pupils and teachers alike.

The larger consolidated schools are newer, usually better built and equipped, and may be, in some respects, safer places to send children. On the other hand there are definite health problems associated with consolidation. The packing of school children into busses and the over-crowding of school rooms, due in many instances to the inadequacy of limited facilities to properly convey and house the large number of pupils transported to consolidated schools, brings the children in close contact and greatly increases the opportunity for spread of disease. Furthermore, before consolidation became so general, if a disease broke out in a school, it usually could be confined to a single community. However, under the present system of consolidation, in which children from different communities may be transported in a single bus or brought together in one building, epidemics can easily spread to several communities. Another objection to consolidation having definite health implications is that which results from many children being required to leave home before daylight throughout much of the year, to wait for school busses in exposed and frequently cold shelters, and to return after dark. Closely associated with this necessity for children to be away from home all day are several problems of a nutritional nature. Children of poor families, ashamed of their paltry lunches often wrapped in newspapers or carried in paper sacks, have been observed to throw away such lunches before joining children from other communities with whom they were not so well acquainted. Thus these children, who probably need a nutritious lunch more than anyone else, either do without or depend for food upon the school hot lunch program if such is available. Unlike many of their more favored schoolmates, they cannot run out during the noon recess and buy a bottle of "pop" and a "hot-dog" or a piece of candy since most of their parents are too poor to provide them with money to spend for such purposes. Therefore, during the period when strong bodies and minds should be built and reserve strength stored, many school children of both well-to-do and poor families, are forming poor food habits and food prejudices which unquestionably will adversely affect their later lives. Consolidation may save school operating costs, but it is doubtful whether such a system is conducive to the health and well-being of the school children.

The present trend seems to be the neglect of the typical one-room school and the building or enlargement of consolidated schools. The former occurs, even at those schools where, because of location, transportation of pupils to consolidated schools probably never will be feasible. Local one- and two-room schools can and should be just as sanitary as consolidated schools

Some interest is being shown on the part of school boards where school sanitation programs are working.

Teacher attitude is gradually being developed not to accept poor conditions as one does the weather. Improved teacher training involving higher educational requirements is helping with this problem.

Some improvements are being affected by Parent-Teacher's Associations, but it seems axiomatic that the more such organizations improve, the more the boards expect from them—a most discouraging and short-sighted policy.

The increased improvement of secondary roads for all-weather use is making more schools available to health programs the year 'round.

Tourist Camps

Many businesses in West Virginia will gain financially by an increase in tourist traffic, and the sanitation and attractiveness of our tourist camps will help to determine whether or not visitors return and recommend our state to others. Sanitation at tourist camps is governed by the 1937 regulation of the Public Health Council. Prior to travel restrictions 243 tourist camps were being supervised by local health departments, and 78 of these displayed the metal signs showing approval by the State Department of Health. However by April 1943, the number of tourist camps had materially decreased, probably being less than 200. In giving its approval, the Health Department takes into consideration the appearance and orderly operation of the camps as well as their sanitation. Each year a list of the approved camps is distributed throughout the state to points where it will be available to tourists.

The Department of Health first began approving tourist camps in 1937 when 14 were permitted to display a sign. There were 38 in 1938; 43 in 1939; 56 in 1940; and 78 in 1941. Approval has been slow since only those camps complying with all items of sanitation and operated in an orderly manner have been approved.

A glaring weakness in the camps offering accommodations to the tourists is the appearance of the buildings and grounds, an item which perhaps has very little to do with sanitation but nevertheless is important. Camp owners in many instances have given little or no consideration to the selection of a site. Many camps are located a few feet from the main highway on a small plot of ground with no shade or grass. In too many cases no attempt has been made since the camp was constructed to give it a pleasing appearance. A tourist stops at a camp to rest, and it is just as important to be rested mentally as physically.

The cabins, in many instances, are poorly constructed, are small and made of rough lumber. Instead of paint, stain or whitewash has been used.

The other buildings in the camp should also be made clean and attractive as well as the cabins.

These items are taken into consideration in the approval of a camp and have, in several instances, been the one factor responsible for withholding such approval. This point will be given even more consideration in the future.

Furthermore, nine camps have been closed or had signs removed due to unsanitary conditions. Some have remained closed, while others have made corrections and are being allowed to operate. This work should be extended to cover all hotels, tourist camps and tourist homes in the state.

The West Virginia Public Health Council, at a meeting March 3, 1942, passed regulations governing the sanitation of house trailer, tourist, resort or industrial camps including: classification according to accommodations available; requirement of a permit to operate; requirement of submission of plans for new camps to the Department of Health for approval before construction; more attention to landscaping of grounds, the architectural features of buildings, and the location; and a requirement that all guests register before a cabin may be rented. The enforcement of these regulations will help materially in improving the tourist camp problem in the state.

Swimming Pools

Industrial development in West Virginia with the resulting pollution of many of our streams by domestic sewage and industrial wastes such as mine acids, tar oil, tannery and pickling wastes, has made the waters of the majority of the old swimming holes unattractive and dangerous. As a result, the public has been demanding artificial swimming pools. Table VII outlines the location, description, and rating of the 83 artificial swimming pools in the state.

Table VII

ARTIFICIAL SWIMMING POOLS IN WEST VIRGINIA

Town	Name of Pool	Description	Remarks
Athens	*Concord College	TrFpCgmAasgH	Excellent
Beckley	Waterdale	TrFpCgm	Good
Beckwith	Fayette County 4-H	TrFgCgd	Good
Berkeley Springs	*Pines	TrFpChmAasg	Good
Berkeley Springs	*Berkeley Springs	Tf	Good
Bethany	*Bethany College	TrFpCgmAapH	Good
Bluefield	Bluefield Country Club	TrFpCgmAasgH	Good
Buckhannon	West	TrFpCgmAasgH	Excellent
Caldwell	Camp Anne Bailey	TdChm	Poor
Cameron	Municipal	TrFpCgmAaspH	Good
Capon Springs	Capon Springs	Tf	Fair
Charleston	Edgewood Country Club	TrFpCgmAasgH	Good
Charleston	Kanawha Country Club	Td	Poor
Charleston	Rock Lake	TrFpCgmNAasg	Good
Charleston	Union Mission	TrFpCgmAap	Fair
Charleston	Southmoor Country Club	TrFpChm	Fair
Charleston	*Y. M. C. A.	TrFpChmAapH	Good
Charleston	*Y. W. C. A.	TrFpChdAap	Fair
Charleston	Kanawha State Forest	TfCgd	Poor
Chester	Rock Springs Park	TrFpCgmAasg	Fair (not open)
Clarksburg	Clarksburg Country Club	TdChd	Poor (not open)
Clarksburg	*Enraw Club	TrFpChd	Fair (not open)
Clarksburg	*Kelley Miller High School	Td	Poor
Clarksburg	*Washington Irving H. S.	Td	Poor
Cowen	Camp Caesar	TrFpCgmAaspH	Fair
Dunbar	4-H	TrFpCgm	Poor
East Rainelle	Rainelle Pool	TrFgChd	Poor
Elkins	Elkins Children's Home	TrFpCgmAasgH	Fair (not open)
Elkins	*Y. M. C. A.	TdChd	Poor
Ellenboro	Washington Inn	TrFpCgmAasgH	Fair (not open)
Fairmont	*Fairmont State Teach. Col.	TrFpCgmAasgH	Excellent
Fairmont	Field Club	TdChd	Poor
Fairmont	Municipal	TrFpCgmAaspHN	Excellent
Follansbee	Municipal	TrFpCgmAasgH	Fair
Gary	U. S. Coal Co. Employ. Club	TdChd	Poor
Glen Dale	Neely Park	TfChd	Poor
Hacker Valley	Holley River State Park	TrFpCgmAasgH	Good
Holden	Holden Pool	TrFpChmAasg	Good

* Indoor pools

Town	Name of Pool	Description	Remarks
Huntington	Camden Park	TdChm	Poor
Huntington	Guyan Country Club	TdChd	Fair
Huntington	*Marshall College	TrFpCgm	Fair
Huntington	*Y. M. C. A.	TrFpChmAasgH	Fair
Institute	*W. Va. State College	TrFpCgmAasgH	Good
Kenova	Dreamland	TrFpCgmN — ?	Excellent
Mathias	Lost River State Park	TrFpCgmAasgH	Good
Milton	*Morris Memorial Hospital	TrFpCgmA — ?	Fair
Montgomery	Municipal	TrFpCgmAcsgH	——
Morgantown	*Elizabeth Moore Hall	TrFpCgmAap	Good
Morgantown	Morgantown Country Club	TdChd	Poor
Morgantown	Riverside Pool	Tr&fFgCgd	Poor
Mannington	Municipal	TrFpCgmAasg	Good
Moundsville	Community Pools	TdCgm (3)	Poor
New Martinsville	Blake	TrFvCgmAasd	Excellent
Parkersburg	Country Club	Td	Poor
Parkersburg	Municipal	TrFvCgmAasgN	Good
Parkersburg	*Y. M. C. A.	TdChd	Poor
Piedmont	Municipal	TfChd	Fair
Point Pleasant	Shawnee	TrFpCgmAaspH	Fair
Point Pleasant	Camp Conley	TrFpCgm ?	——
Princeton	Shawnee Lake	TrFpCgmAasg	Fair
Ravenswood	Municipal	TrFvCgmAasg	Good
Ripley	Roosevelt	TrFpCgmAaspH	Fair
Rock	Rockview	TrFpCgmAap	Poor
Saint Marys	Kiwanis	TrFpCgmAasgH	Fair
Seebert	Watoga State Park	TrFpCgmAasgH	Good
Spencer	Municipal	TrFpCgmAasgH	Fair
Sweet Springs	Old Sweet	Tf	Good
Weirton	Christian Center	TdChd	Fair
Weirton	Margaret Mansfield Weir	TrFpCgmAasgNH	Excellent
Weston	Jackson's Mill	TrFpCgmAasgH	Good
Wheeling	City Park	TrFpCgmNAasgH	Excellent
Wheeling	Fresh Air Farm	TdChd	Fair
Wheeling	Giscowheco (Girl Scouts)	TdChm	Fair
Wheeling	Oglebay Park	TrFpCgmH	Good
Wheeling	*Ritchie Graded School	TrFpCgmH	Fair
Wheeling	State Fair	TdCgm	Fair
Wheeling	*Y. M. C. A.	TrFpCgmAapH	Good
Wheeling	*Y. W. C. A.	TrFpCgm	Fair
White Sulphur Springs	*Greenbrier	TfCgm	Good
Williamson	Mingo Country Club	TdChd	Poor
Williamson	Municipal	TrFpCgmAasd	Fair
Williamson	*Williamson High School	TrFpChd	Poor
Winfield	Salvation Army	TdChd	Poor

LEGEND

Type of Pool—T
- Recirculating—Tr
- Flowing through—Tf
- Fill and draw—Td

Chlorination—C
- -Gas—Cg
- -Hypochlorite—Ch
- -Fed by machine—Cm
- -Fed by hand—Cd

Hair Strainer—H

Ammonia—N

Equipment
- Filters—F
- -pressure—Fp
- -gravity—Fg
- -vacuum—Fv

Chemical Feeders—A
- -Alum—Aa
- -Soda Ash—As
- -Pressure—Ap
- -Gravity—Ag
- -Displacement—Ad

* Indoor pools

But this has carried with it definite threats to public health including the spread of athlete's foot, epidemics of skin and middle-ear infections, and an increase in naso-pharyngeal infections. It is also believed by some that the heavy chlorination necessary for bacterial control of the water used in many pools is injurious to the eyes and contributes to sinus trouble. Therefore, the need for adequate control of these pools seemed quite apparent and the following act was passed by the Legislature March 4, 1939:

"The public health council shall promulgate and enforce regulations covering the design of all public water systems, plumbing systems, sewerage systems and sewage treatment plants, swimming pools and excreta disposal methods in West Virginia, whether publicly or privately owned, and the operation and qualifications of chlorination plant operators, chemists, bacteriologists and superintendents of filtration, or others who are in actual charge of plant operation of all public water systems, sewage treatment plants and swimming pools."

Under the above authority granted by the State Legislature, the following regulation was passed by the public health council:

"Section 1: Definitions: The term 'swimming pool' as used in this chapter, shall mean any swimming pool other than one maintained by an individual for the use of his family or friends and unless otherwise specified, shall be construed as including 'artificial', 'partly artificial' and 'natural' pools or bathing beaches.

"The term 'artificial pool' shall mean either indoor or outdoor pools which are entirely of artificial construction. The term 'partly artificial' shall mean a pool formed from a natural body of water which has either so limited a flow or such an inadequate natural circulation that the required quality of the water must be maintained by artificial means. The term 'natural pools or bathing beaches' shall mean public bathing places on natural streams or lakes.

"Section 2: Permit and Revocation: No person, firm, corporation, institution or municipality shall establish, construct or maintain any swimming pool within the State of West Virginia without first obtaining a written permit from the State Department of Health. This permit shall be obtained in the following manner: Any person, firm, corporation, institution or municipality desiring to construct, add to or modify, or to operate and maintain any swimming pool within the State of West Virginia, shall file application for permission to do so with the State Department of Health, which application shall be accompanied by detailed maps, drawings, specifications and description of the structure, its appurtenances and operation; description of the source of water supply, method and manner of water purification; life saving apparatus and measures to insure safety of bathers; method and manner of washing, disinfecting, drying and storing bathing apparel and towels; and measures to insure personal cleanliness of bathers. Any such permit may be revoked for cause after an investigation by any official of the State Department of Health.

"Section 3: Construction and Maintenance: Every swimming pool shall be designed, constructed and equipped in accordance with the 'Standards for Design, Construction, etc., of the State Department of Health' and shall be maintained and operated so as to be clean and sanitary at all times.

"Section 4: Bacterial Quality of Pool Water: All bacterial analyses shall be made in accordance with the procedure recommended in the Standard Methods of Water Analyses. The bacterial quality of swimming pool waters shall at all times comply with the requirements of the State Department of Health."

As required by the regulation, no swimming pool may be constructed until plans and specifications have been approved by the State Health Department. Standards for design, as established by the Joint Committee on Bathing Places, American Public Health Association and Conference of State Sanitary Engineers, have been adopted by the State Health Department.

To control operation of swimming pools, an engineer from the State Health Department visits each pool at least once a year. Every two weeks a sanitarian from the county health department makes an inspection of the swimming pools in his county, and collects samples of the pool water for bacteriological analyses. Specific instructions are mailed to each pool every spring regarding the proper operation and maintenance of the swimming pool equipment and bathhouse.

Trends and Problems

The discernible trends are from natural to artificial pools, from private to municipal ownership, and a growing public confidence in artificial pools.

As previously pointed out, the pollution of our streams has forced the abandoning of many of our natural swimming pools. With the establishment of Federal aid projects, municipalities have definitely stepped into the field. Swimming pools were recently constructed with Federal aid at Concord College, Fayette County 4-H Camp, Pines (Berkeley Springs), Cameron, Kanawha State Forest, Camp Caesar, Fairmont, Follansbee, West Virginia State College, Lost River State Park, Morris Memorial Hospital, New Martinsville, Parkersburg, Ravenswood, Ripley, Watoga State Park, Spencer, Wheeling City Park and Oglebay Park, and Williamson.

There is still considerable swimming in polluted streams. In many cases it is because suitable swimming places are not available, while in other cases it is due to ignorance of true conditions, lack of proper warning by health authorities, or indifference. As artificial pools are not normally money-makers, it is doubtful if any extensive construction will be done except by municipalities with Federal aid. Public health education should be undertaken by the State and local health departments, but extensive work cannot be done until more data are obtained on the streams. In this connection also

the classification of streams would be very helpful, since it would enable the State Health Department to more reliably inform the public which natural streams are safe for swimming.

Many of the pools that were constructed prior to the adoption of the regulation by the Public Health Council are poorly equipped. Only 57 of the 83 artificial pools are equipped with filters, which should be a requisite of all pools, except "flowing through" pools with at least an 8-hour turnover. Many of the 57 pools with filters do not have adequate filter area to maintain a clear and safe water. Chemical feeders are a problem in the majority of the pools where pressure pots have proven to be unreliable and difficult to maintain in an operating condition. The State Health Department now requires gravity solution feeders or displacement feeders, and therefore, does not anticipate any future trouble.

A serious problem is the poor operating personnel at many of our swimming pools, especially in the municipal pools where they usually change every year or two. In municipal pools the operators are usually political appointees that are not always chosen for their ability to operate purification equipment. After spending a season or so training a man, it is not uncommon to see him replaced by an appointee of a new administration. We have urged all our swimming pools to hire school teachers who have had chemistry or physical education, as they have the background to learn proper operation and would probably be available every year, as swimming season is during their summer vacation.

A problem in many of the pools does not directly relate to the operation of pools. In many cases a cross-connection exists between the swimming pool and a potable water supply. In times of fire, line repair or other cases, when there is a low or negative pressure in the potable water line, there is danger of water passing from the pool to the potable supply through a leaky valve.

Needed Improvements

The following would contribute much to the safety and enjoyment of the wholesome exercise of swimming:

(1) Establishment of a system of stream classification in order that the public can be informed as to the streams that are suitable for swimming.

(2) Classification and regulation of artificial swimming pools on the basis of their equipment, operation and bacteriological results.

(3) As soon as the materials are available, a program of improvement should be worked out for pools that do not meet minimum requirements. In order to retain operating permits, it should be mandatory that needed improvements be made.

(4) Preparation of a regulation, as authorized by State law, requiring licensing of swimming pool operators. As a prerequisite short courses in swimming pool operation should be conducted.

(5) Establishment and enforcement of a regulation requiring all swimming pools to eliminate cross-connections between the pools and potable water supplies.

In Nutrition

We are becoming increasingly aware that nutrition is no longer an academic matter, but a subject of very vital and practical importance. The burden of concern with nutrition and its effect on the health and well-being of the population has been taken out of the classroom and given the scope of a national objective.

The first major step in this direction was the appointment by the National Research Council in 1940 of a committee on Food and Nutrition to work out the daily per capita requirements of the various nutrients supplied by our foods. This was followed by the National Nutrition Conference called by President Roosevelt in May 1941, the first nationwide conference on nutrition ever called in this country. The aim of the latter was to define our nutritional problems and to work out plans for solving them. At the same time, individual states began to set up their own plans for solving local problems through state and accessory county committees. The purpose behind all of this organization was to translate scientific findings into a program of action so that every individual in the nation might have the opportunity to benefit from the newer knowledge of nutrition.

It is of interest to note that a State Nutrition Committee was appointed in West Virginia in November 1940, six months before the National Conference. This was followed in June 1941 by a conference at Jackson's Mill at which representatives of various organizations discussed nutritional needs and problems of the state. By midsummer of 1941, most of the counties had started plans for organizing local committees. In August of the same year, a refresher course was held at West Virginia University to help representatives of the different counties with their problems. In April 1942, the second state conference was held at Jackson's Mill in conjunction with the State Home Economics Association meeting.

At the present, in addition to the state and county nutrition committees, the following agencies are concerned with meeting the nutritional needs of the people of the state:

a. The Red Cross contacts a large number of women through the nutrition and canteen courses.

b. There were 7,754,258 hot lunches served by the schools of the state during the 1941-42 term. Thousands of school children, through WPA and/or local support, have received a nutritious, hot meal at noon to supplement in many cases an otherwise inadequate diet. Due to the discontinuance of WPA, many children will be deprived of this necessary supplement, unless the communities carry on. It is gratifying to note that several communities are continuing the program. Besides the benefit to the child,

there are distinct social values when communities assume such responsibilities.

c. The elementary teachers of the state are now required to teach rudimentary nutrition along with the conventional three-R's.

d. The Public Health Service, through county physicians, gives information on nutrition in the form of talks and publications. In addition a full-time nutritionist is employed by the State Department of Health who gives consultation service to the county and district health department staffs, and cooperates in planning local programs with other state and federal agencies, including the Department of Education, the Department of Agriculture, and the Work Projects Administration. She also gives talks to local medical and dental societies.

e. The Office of Civilian Defense is giving out information on how to select, purchase, and prepare food.

f. The Office of Price Administration publishes and distributes information on nutrition in connection with rationing. In cooperation with the Retail Grocers' Association, O. P. A. has organized nutrition classes for grocers so that the latter may assist housewives with food selection.

g. The Farm Security Administration has home management supervisors in 41 of the 55 counties in the state who assist many low-income farm families with nutrition problems.

h. The Agricultural Extension Division employs a specialist to supervise its nutrition program in the state. Farm women's clubs devote from one to four meetings a year to nutrition and health, and 4-H clubs have a membership of 28,000, many of whom elect to participate in foods and nutrition projects. Extension Neighborhood Leaders are interpreting to the families in their neighborhoods the food production program for the state.

i. The Food Distribution Administration, successor to the Surplus Marketing Administration, is sponsoring the Penny Milk Program for school children. This agency is planning to add a nutritionist to the headquarters staff in Charleston.

Nutrition problems are many; however, only the following of immediate concern and importance will be discussed:

(a) The School Hot Lunch. As previously pointed out, many children formerly receiving school lunches under WPA supervision will be deprived of an adequate diet unless communities assume the responsibility for providing a nutritious noon meal. Every community must be brought to realize the importance of supplying a hot lunch for all those children not adequately fed at home. It is unfortunate that in the past the hot lunch has been in the main a feeding problem and not a nutrition education one also.

(b) The Food Supply. A glance at the accompanying graph, Chart 2, comparing the production of selected agricultural products in the state with the recommended consumption shows that, in regard to food produced, West Virginia is a "have-not" or "deficiency" state. The inaccessibility of many communities, together with our growing dependence upon fresh foods and with increasing demands upon transportation in war-time, make a scarcity of food a possibility. The location of defense areas in the state has accentuated the problem.

(c) The Kitchen Front. Too many housewives do not know how to plan meals, select, and prepare food to get the most in palatability and nutritive value. Food habits and food prejudices are obstacles to progress in this direction. The latter, of course, applies to the whole family.

(d) Objective Evidence of Malnutrition Lacking. Another problem arises from the absence of definite information in regard to the nutritional status of the people of the state. Doctors, nurses, teachers, and nutritionists are well aware that malnutrition does exist, but, for the most part, their observations are subjective in nature. Dr. W. B. Baily, director of the Monongalia County Health Unit, states that at least 30 percent of the children whom he has contacted are malnourished.

(e) Selective Service. An appalling number of our young men have been rejected for Selective Service or as volunteers because of defects directly or indirectly attributable to improper nutrition during the early years of their lives. The exact percentage has not been determined but is admitted to be shamefully high.

In Communicable Diseases[5]

"Morbidity from acute communicable diseases has decreased markedly in the past two years, only influenza, measles, and anterior poliomyelitis (infantile paralysis) reaching epidemic proportions during this period.

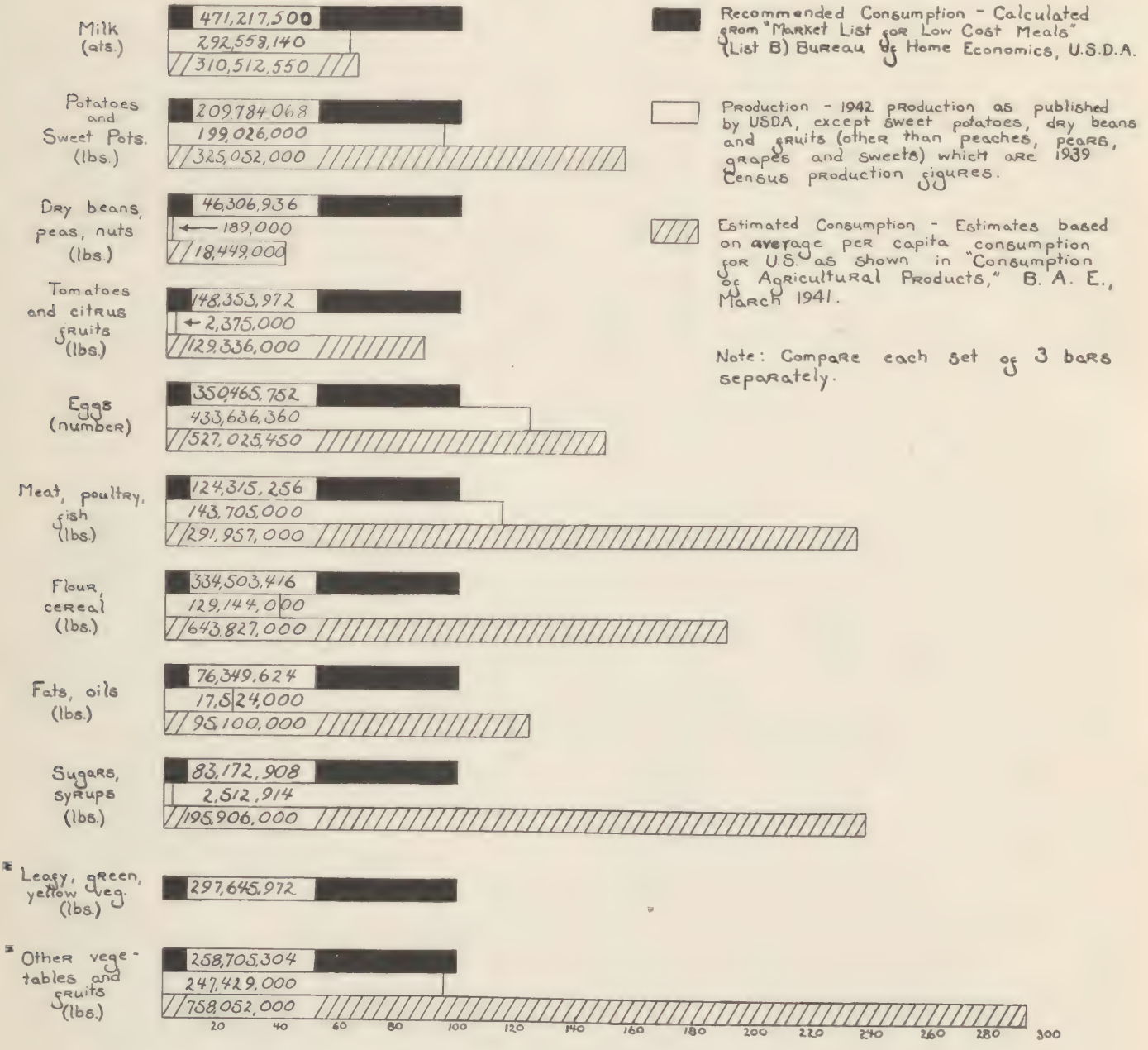
"While the death rate from tuberculosis has continued to decline, it is still one of our greatest public health problems. There continue to die each year in West Virginia from tuberculosis approximately 900 persons, mainly at a time of life when they should be most useful to the community and are taking on responsibilities in the creation of homes.

"In 1940 there were 22,368 cases of communicable diseases reported. In 1941 there were 74,440, or a total for the two year period of 96,808. During the biennium period of 1938-1939, there were 46,686 communicable diseases reported. Practically all of this increase in the number of cases reported can be attributed to the large epidemic of influenza which occurred during the calendar year 1941. The following table gives the number of cases of the various communicable diseases which have been reported to the Department each year over a five year period, 1937-1941 inclusive:

[5] BIENNIAL REPORT OF THE STATE HEALTH DEPARTMENT OF THE STATE OF WEST VIRGINIA. Biennial Period July 1, 1940—June 30, 1942.

Chart 2

Recommended Consumption, Production, and Estimated Consumption of Important Agricultural Products in West Virginia**



* Production and consumption of green and yellow vegetables not available separately.

** Prepared by Helen G. Charley, Instructor in Home Economics, W. Va. University, from data furnished by H. M. Brewer, Agricultural Statistician, W. Va. Dept. of Agriculture and U. S. Bureau of Agr. Economics.

Table VIII

New Cases of Communicable Diseases Reported Each Year Over Five Year Period 1937-1941
(Total population 1,901,974 according to 1940 Census)

	1937	1938	1939	1940	1941
Anthrax	4	1	——	——	1
Chickenpox	1608	2010	1451	1394	1376
Diarrhea	——	17	3	——	21
Diphtheria	713	581	503	338	309
Dysentery (bacillary)	14	62	53	99	94
Encephalitis	1	4	17	3	3
Erysipelas	24	9	10	7	5
Glanders	——	——	——	——	——
Gonorrhea	1274	1560	1595	1465	1916
Hookworm	——	1	4	1	2
Influenza	8322	1272	2754	7544	45441
Leprosy	1	——	——	——	——
Malaria	6	——	5	9	7
Measles	2126	10731	478	694	12605
Meningitis	214	132	72	72	58
Mumps	453	255	834	371	1632
Ophthalmia Neonatorum	5	13	9	10	9
Para-typhoid	2	8	3	8	4
Pellagra	9	6	26	10	7
Pleurodynia	——	——	——	——	——
Pneumonia	145	182	348	536	809
Poliomyelitis	68	17	64	662	49
Rabies (in humans)	——	1	3	2	1
Rocky Mountain Spotted Fever	2	1	6	4	6
Syphilis	3233	4887	3738	2859	3726
Scarlet Fever	2725	2405	2348	1889	1940
Septic Sore Throat	7	20	39	77	103
Smallpox	18	8	26	6	5
Tetanus	——	1	3	3	——
Trachoma	12	2	166	243	78
Tuberculosis (all forms)	1608	1751	1689	1686	1893
Tularemia	4	20	15	7	13
Typhoid Fever	348	430	390	209	229
Typhus Fever	——	——	2	1	——
Undulant Fever	7	8	9	5	7
Vincent's Angina	16	57	57	49	17
Whooping Cough	3251	2886	1035	2233	2220

"There has been a tremendous expansion in the program looking to the control of venereal diseases, for the reason that it was discovered that these diseases account for a large number of rejections among the (military) selectees. The department is carrying on an extensive program for the control and treatment of these diseases. All selectees rejected because they are infected by these diseases are referred to this department. The department has inaugurated a follow-up service in which all such selectees are located and required to obtain treatment, either from their private physicians or from one of the clinics conducted by this department.

"There is no way in which an exact figure can be given as to the number of cases of venereal diseases existing in the state, but from surveys which have been made it is estimated that there are approximately 95,000 cases of syphilis alone. The state is maintaining at the present time sixty public clinics scattered in the various counties of the state where anyone, infected with either gonorrhea or syphilis, may obtain treatment provided he is unable to pay for private medical care. In these clinics during the fiscal years 1941 and 1942 the state treated 4,023 cases of gonorrhea and 13,888 cases of syphilis. There are probably a similar number of persons being treated by private physicians, but by far the greater percentage of patients are receiving no treatment at all. Particularly is this true of persons infected with syphilis.

"While the early case of syphilis can be adequately treated in public clinics, the late case, in which the patient develops neurosyphilis, cannot receive acceptable treatment there. The program for the treatment of neurosyphilis which was worked out with the Department of Public Assistance and the Advisory Committee of the State Medical Association, whereby these cases were treated at one of the state hospitals, has been discontinued. These patients are now sent to Hot Springs, Arkansas, where they are treated by the United States Public Health Service. The only expense to the state in getting these cases treated is travel to and from this center. The treatment and maintenance for these patients is provided free by the United States Public Health Service, provided that they are indigent and are unable to pay for this service themselves. While unquestionably it is impossible for all of the cases which should receive medical care to be treated by this department, it is hoped that through this program the citizens of the state will realize it is far better to finance a program for their treatment during the early stages of the disease than it is to maintain them in our state institutions for the insane for the balance of their lives."

There are about 4,000 patients hospitalized in the four state mental hospitals and of these approximately 400, or 10 percent, were admitted as a result of central nervous system syphilis. There are no cases of insanity due directly to other venereal diseases although a few patients admitted for other reasons have been found to have gonorrhea also.

Table IX

Prevalence of Syphilis Among West Virginia Registrants by Race and Age Based on Blood Tests Performed from November 1, 1940 Through April 15, 1941

Race	Age	Total Persons Syphilis Detected		Total Persons Tested		Syphilis Rate per 1,000 Persons Tested	
		W. Va.	U. S.	W. Va.	U. S.	W. Va.	U. S.
White	18–20	6	120	581	11,241	10	10
	21–25	161	4,953	7,147	466,527	22	10
	26–30	162	5,209	3,312	236,833	48	22
	31–35	132	5,205	1,740	135,685	75	38
	36–40	7	220	46	4,833	15	45
Total		468	15,707	12,826	855,119	34 Av.	25 Av.
Negro	18–20	8	765	199	7,308	40	104
	21–25	86	10,035	724	52,930	118	189
	26–30	106	9.094	409	30,522	259	298
	31–35	86	7,365	305	20,710	281	355
	36–40	1	312	8	892	12	349
Total		287	27,571	1,645	112,362	142 Av.	259 Av.

The prevalence of syphilis in West Virginia among selectees and volunteers examined through April 15, 1941 by county of residence shows a total of 15,675 persons tested of which 825 were found to be infected indicating a syphilis rate of 52.6 per 1,000 tested.

Dr. R. A. Vonderlehr and Lida J. Usilton of the U. S. Department of Public Health[6] report that **West Virginia had the sixth highest syphilis rate for white men and twenty-first highest rate for negro men** as shown by an analyses of 1,895,778 serologic reports of men aged 21–35 who were examined throughout the United States under the Selective Training and Service Act of 1940.

In prosecuting a program to control and eliminate communicable diseases, a note of caution needs be sounded. Much careful study and planning should precede the disbursement of funds to make sure that the money available is spent in proper proportions in counter-acting those diseases which are most serious or likely to become so, which involve the largest number of people or are prevalent over the widest area of the state, and which constitute the greatest threat to the welfare of our people. The following table comparing tuberculosis and venereal diseases illustrates this point.

Table X

Disease	Est. New Cases Per Year 1941	Est. Tot. Cases in State Dec. 31, 1941	No. Cases on Record at State Health Dept. Dec. 31, 1941	Tot. State Expend. for Treatment 1941	Av. Expend. Per Case Recorded 1941
Tuberculosis	1893	8.700	6639	$1,776,896**	$267.64
Venereal Diseases:				$ 86,622***	$ 15.51
Syphilis	3882	95,000	5230*		
Gonorrhea	11646	No. est.	355*		

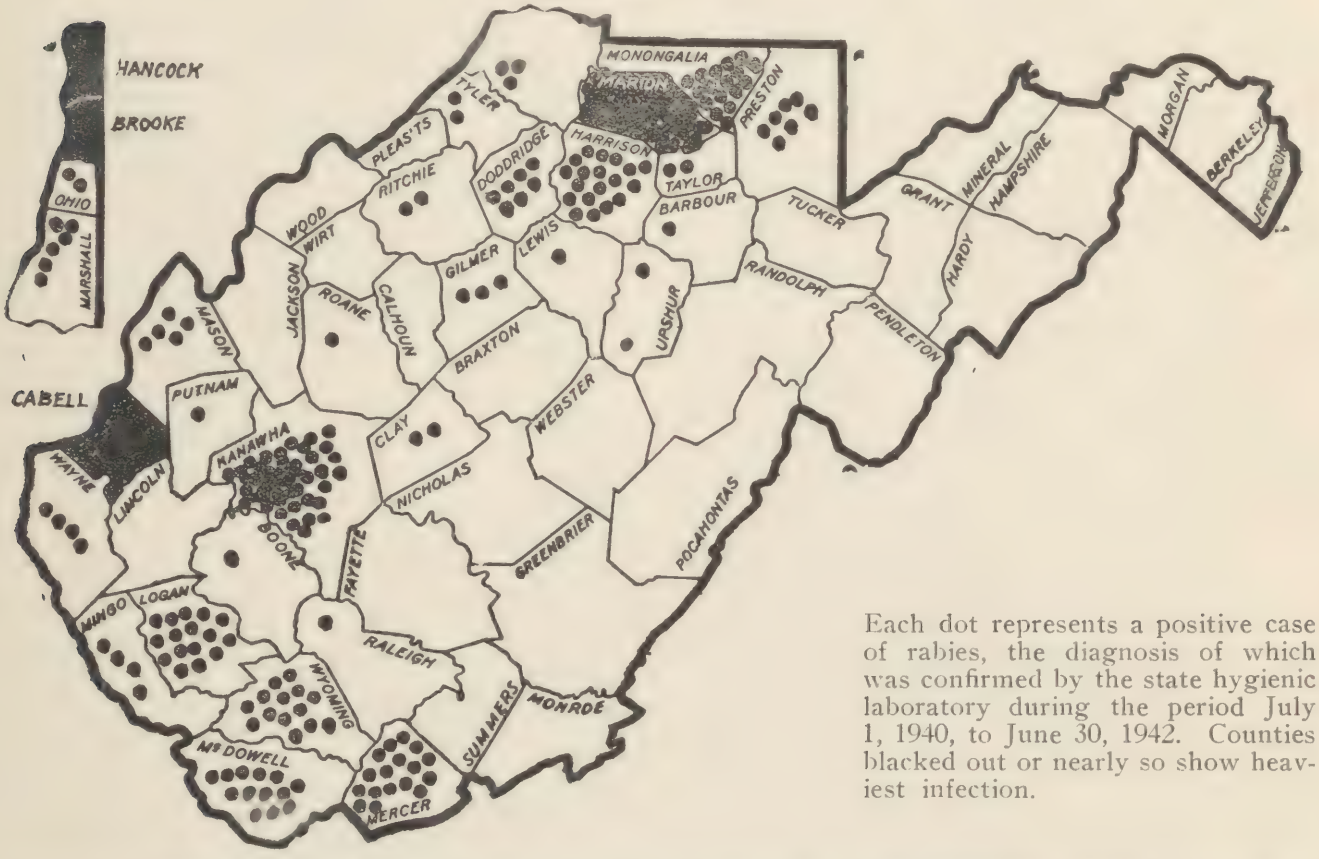
* Under treatment in clinics on June 30, 1942.

** Includes actual expenditures in 1941 at Denmar ($95,898), Hopemont ($652,797), and Pinecrest ($917,625) sanitariums and for the Tuberculosis Field Clinic ($7,127), Department of Public Assistance Hospitalization of Needy Tubercular ($89,244), and the Bureau of Tuberculosis ($14,205) according to the Board of Public Works Budget Document for the biennium July 1, 1943 to June 30, 1945.

*** See page 60 of The Biennial Report of the State Health Department for the biennium July 1, 1940 to June 30, 1942.

Prevalence of Rabies in West Virginia

Figure 2



Each dot represents a positive case of rabies, the diagnosis of which was confirmed by the state hygienic laboratory during the period July 1, 1940, to June 30, 1942. Counties blacked out or nearly so show heaviest infection.

[6] Vonderlehr, R. A., M. D., Asst. Surgeon Gen., U. S. Pub. Health Ser., and Usilton, Lida J., M. A., Prin. Statistician, Div. Venereal Diseases, U. S. Pub. Health Ser: SYPHILIS AMONG MEN OF DRAFT AGE IN THE UNITED STATES. J. A. M. A., Vol. 120, Dec. 1942, pp. 1369–1372.

Rabies[7]

Rabies continues throughout the southern, central, and northern panhandle sections, and appears to be on the increase and moving eastward across the state, (Figure 2). During the biennial period July 1, 1940 to June 30, 1942, the state's hygenic and pathological laboratories made numerous positive reports from the brains of dogs, cats, cattle, and wild fox, representing an increase of 127 percent over the 156 cases reported for the previous period. Because of failure to report all cases, however, it seems certain that these figures represent considerably less than half the actual number.

In addition to the loss of human life, of which four cases were unofficially reported during the past biennial period, hundreds of persons bitten by dogs, or otherwise exposed, took Pasteur treatment in this state, necessitating the expenditure of large sums of public and private funds. In addition, the loss of livestock amounts to several thousand dollars annually.

Apparently this condition will exist until such a time that proven measures of control have been adopted as has been done in many foreign countries where the disease has been completely eradicated.

Carbon Monoxide[8]

"The nature of carbon monoxide and its immediate effect when inhaled in sufficient amounts to produce acute asphyxiation and death is well known. The remote or secondary effects and the chronic states of ill health occurring among individuals who are habitually exposed, often many hours daily over long periods, are less well understood and are not always recognized.

"During these studies a number of patients were encountered whose illness could be definitely traced to the effects of the gas. An analysis of 150 consecutive cases studied over a period of years showed that geographically they were unevenly distributed. The incidence among residents in districts where natural gas is the chief source of fuel for heating and cooking was found to be greater than it was among those residing in other districts. This was found to be due largely to the carelessness with which the gas was handled, such as burning faulty, poorly adjusted stoves and the almost universal lack of vents.

"Communities consuming much natural gas in the homes are confronted with an important domestic problem. In the State of West Virginia, of those cases whose illness was attributed to gas, 80 percent were engaged in non-industrial pursuits, housewives and domestic employees predominating; whereas in Maryland, where less gas is consumed for domestic purposes, only 36 percent were non-industrial.

"Thus, properly to evaluate carbon monoxide as a health hazard, the domestic problem as well as the industrial, and the late or secondary manifestations as well as the acute, must be considered.

"Engineers in examining defective gas appliances in the field soon found that carbon monoxide, whenever present in dangerous amounts, was confined to a limited space. Sometimes it was found about the kitchen range, the hot water heaters in the kitchen, bathroom or basement laundry, a radiant or other type of heater in the living room and bedroom, etc. Under these circumstances, only those occupants of the house engaged in cooking or laundry work, or those who slept in gas-heated rooms, or who were confined to other close quarters where there were defective heaters would suffer from the effects. Thus it happens that one individual in a family group may become ill and the blood show a considerable amount of carbon monoxide, while others remain entirely free from symptoms, and the blood show no trace of carbon monoxide.

"In order of frequency the leading symptoms based on an analysis of 150 cases previously studied were:—headache, weakness, vertigo, nervousness, dyspnoea, paresthesia, muscular twitching, emotionalism, nausea, drowsiness, unsteady gait, neuromuscular and joint pains, tremor, muscular cramps, cough, sweats, vomiting, insomnia, anorexia, precordial distress, vasomotor instability, perversion of taste and smell, speech defect, impairment of hearing, hoarseness, yawning, etc.

"Naturally, all of these symptoms do not occur in the same individual at any given time. The number and variety depend primarily upon the quantity of carbon monoxide in the air and the length of exposure, and secondarily, upon the activity and susceptibility of the individual and the amount of carbon monoxide in the blood, as well as upon other factors involved. Their significance is enhanced by the fact that the individual has been exposed to gas; that the symptoms developed during the course of the exposure; and that they subsided within a reasonable time in the open fresh air where they were no longer exposed. In the milder cases of short duration such symptoms as headache, weakness, vertigo, numbness, drowsiness, staggering gait, nausea, etc. abated in 15 to 20 minutes and the individuals were often completely relieved in several hours. Whereas, in individuals daily exposed over periods of weeks or months the symptoms do not subside as promptly. Complete restoration may not take place for days or weeks after the last exposure.

"Most of the symptoms are characteristic of simple anoxemia. Others are manifestations of some organic lesion of the central nervous system, including encephalitis, epilepsy, cerebral thrombosis, multiple sclerosis, tetany, etc. Neuromuscular and joint pains are quite common and painful spasmodic contraction of the muscles of the legs and tendons of the toes are fairly characteristic; likewise spasm of the involuntary muscles, especially of the sphincter muscles of the gastrointestinal tract. A significant symptom is fibrillating bundles of muscle

[7] Adapted from the 15th Biennial Report of the West Virginia Department of Agriculture. 1941-1942.

[8] Beck, H. G., M. D., Roetman, E. T., M. S., and Suter, G. M., M. D. COMBUSTION PRODUCTS STUDY. W. Va. Univ. Bul., Series 43, No. 2-1, August, 1942.

fibers which occurred in one-third of the cases, usually in the simple, uncomplicated chronic forms."

It should be pointed out also that gases and fumes from industries as well as exhaust from automobiles contain carbon monoxide, and on damp, humid days may be found in harmful amounts in the atmosphere of industrial communities — all which adds to the total effects on individuals suffering from indoor exposure.

Thus it is evident that carbon monoxide constitutes a definite health hazard in such a high natural gas using state as West Virginia and is deserving of an intensive educational campaign to inform our people of its insidious effects.

In Vital Statistics[9]

This section dealing with vital statistics is included because of the light such data throw on many important aspects of the total public health picture. Significant features of vital statistics are: (1) the ratio of births to deaths, that is, the number of births each year (or for any given period) as compared to the number of deaths during the same time; (2) the causes of deaths in terms of those preventable and those non-preventable; and (3) the influences affecting birth rates such as nutritional, functional, and abnormal environmental conditions such as occasioned by the many disturbing elements associated with war.

Table XI

Births and Deaths 1933 to 1941 Inclusive

Year	Births	Birth Rate	Deaths	Death Rate
1933	36,464	20.2	16,608	9.2
1934	41,509	22.6	17,952	9.8
1935	41,775	22.4	18,342	9.9
1936	40,855	21.6	19,909	10.5
1937	42,246	22.1	19,191	10.0
1938	42,238	21.5	17,716	9.12
1939	41,331	21.8	17,452	9.18
1940	42,103	22.1	17,626	9.3
1941	43,827	23.0	17,838	9.4

Examination of the mortality rates in West Virginia shows a large number of deaths occurring in the early age groups. The average number of deaths per year given below are estimated on deaths reported in West Virginia for the period 1936-1940 inclusive:

Total deaths per year, all ages	18,336
Deaths occurring during the first day	576
Deaths occurring during the first week	1,036
Deaths occurring during the first month	1,366
Deaths occurring during the first year	2,540
Deaths occurring during the first five years	3,279

Fourteen percent of all deaths occur during the first year; 17.8 percent occur before five years of age; while only 4.9 percent occur during the ages five to nineteen years.

"The number of maternal deaths is influenced by many factors outside of good health and good health teaching. Economic and sociologic factors are causes of many maternal deaths. Standards of medical, nursing, and hospital care are important factors. In addition there is the natural hazard of childbirth. It was shown in the study of maternal care in New York that, under the best possible medical, nursing, and hospital care, as it is understood today, there is an irreducible minimal hazard of between 2.0 to 2.5 maternal deaths per 1,000 live births.[10]

"Infant deaths are influenced by the same factors as are maternal deaths, except that, in this case, education relative to child care and general sanitation are very important. In a study of the causes of infant deaths in 1940, 29.1 percent were caused by prematurity and 7.5 percent were due to birth injuries which reflects directly to maternal care. Of all infant deaths in 1940, 9.2 percent were due to congenital malformations about which nothing can be done. This leaves 54.2 percent of the deaths during that year due to all other causes, and the majority of these were due to infectious diseases. Here better sanitation relative to milk and water supplies, together with proper excreta disposal, play an important part. Education relative to the acute infectious diseases is most important."

The figures in Table XII (below) show that West Virginia has consistently a lower maternal death rate than that for the entire United States, but a higher infant mortality than that for the nation. This is difficult to explain as there is such a close relationship between infant and maternal

Table XII

Comparison of Maternal and Infant Death Rates for West Virginia and the United States Registration Area

	1936		1937		1938		1939		1940	
	W. Va.	U. S.	W. Va.	U. S.	W. Va.	U. S.	W. Va.	U. S.	W. Va.	U. S.
Maternal Death Rates	5.3	5.7	5.0	4.9	3.9	4.4	3.3	4.0	3.3	3.8
Infant Death Rates	71.2	57.1	61.8	54.4	62.3	51.0	54.8	48.0	53.9	47.0

[9] BIENNIAL REPORT OF THE STATE HEALTH DEPARTMENT OF THE STATE OF WEST VIRGINIA. Biennial Period July 1, 1940 - June 30, 1942.

[10] MATERNAL MORTALITY IN NEW YORK CITY. New York Academy of Medicine Committee on Public Health Relations. 1930-32.

death rates. Nevertheless, both are becoming lower in West Virginia. Further endeavors relative to maternal and child hygiene and nutrition should reduce these rates even more.

"Cardiac disease continues to be the leading cause of death, but it is closely followed by accidents, pneumonia, cancer, and tuberculosis. Diseases that are ordinarily classed as 'acute communicable' have ceased to be of major importance as a determining factor in the crude death rate, but there is always inherent danger in these diseases and efforts must be continuous in the application of our knowledge of the methods of control to keep them at a low level.

Table XIII

Number of Deaths in West Virginia During the Calendar Year 1940 for Some of the Principal Diseases as Compared to a Ten Year Average, 1930-1939

Cause	Number During 1940	Average No. Over Ten Year Period 1930–1939
Heart	3,542	2,581
Accidents (all forms)	1,703	1,481
Pneumonia	1,507	1,502
Cancer	1,469	1,243
Tuberculosis (all forms)	876	1,001
Diarrhea and Enteritis (all ages)	204	800
Influenza	343	572
Diphtheria	37	138
Whooping Cough	119	137
Typhoid	36	129
Measles	0	72
Scarlet Fever	20	45
Poliomyelitis	59	16

"It is frankly admitted that the cost of public health in West Virginia has increased during the past few years, but the reduction in the various communicable disease morbidity and mortality rates definitely proves that health is purchaseable provided a community is willing to pay the necessary price for it. Every state or community can determine its own death rate, within certain limitations, particularly as applied to communicable diseases, if programs of public health are formulated on a sound basis, properly financed, and placed in the hands of competent personnel."

II. SUMMARY OF RECOMMENDATIONS

The following sets forth the consolidated opinions of and recommended remedial measures proposed by several authorities on various important sub-phases of the broad field of Public Health. It is strongly urged that these be adopted as the basis of a unified policy for developing and putting in operation, as quickly as possible, a sound, integrated legislative, research, educational, and action program to eliminate those health impediments which stand as definite obstacles to the progress of the state and its people.

Only those recommendations are presented below for which there is at present sufficient supporting information to justify their validity. As indicated in the foregoing section on "Trends", there are many other problems associated with the general health of our people. Much additional information concerning these is required, however, before specific remedial measures can be recommended.

General

(1) Complete control of all public health units and districts should be vested in the State Department of Health, and personnel and facilities should be expanded to the extent necessary to insure an effective public health service in all parts of West Virginia. Careful study and planning should be undertaken immediately so as to make available to all our people a complete public health program embracing: urban and rural water supply protection; proper waste disposal and pollution abatement; sanitation improvement measures including clean milk and food production and handling, clean schools, and clean tourist and hotel facilities; and convincing instruction in proper nutrition and precaution against and suppression of communicable diseases.

(2) The assignment of available personnel and funds should be made on a population-density basis so as to provide: (a) full-time health units, completely staffed and equipped, in highly congested and industrialized counties on a county unit plan; and (b) that all other counties be combined into districts each of which can be efficiently administered and will have sufficient staff and equipment to provide a public health program adequate to meet the needs of a more scattered and largely rural population.

Water Supply and Public Health

(1) More frequent inspection of public water systems and more detailed investigation of potentially dangerous arrangements such as cross-connections and hazardous plumbing should be made under the careful direction of the State Department of Health in an intensive drive to insure that water supplied through public systems will be safe for human consumption at all times.

(2) The State Water Commission is urged to intensify its control of pollution of surface streams to the extent necessary to provide clean sources of water for domestic, industrial, and recreational uses. Likewise, adequate control of pollution of underground water in limestone areas is indispensable to a state-wide health improvement campaign.

(3) A more effective method should be devised and put in operation by the State Department of Health to assist people in rural areas to protect their water supplies. In addition to the present programs of laboratory analyses and education, concrete demonstrations should be provided in local areas. As a possible useful post-war public work project, it is recommended that the State Health Department take under advisement the development

of plans for covering, encasing or otherwise protecting water supplies at rural schools, community buildings, churches, etc.

Stream Pollution

(1) It is recommended that under Chapter 16. Article 11, Section 5 of the State Water Commission Act, the following clause at the end of the section be deleted, "Provided, however, that such Commission shall not institute proceedings against any person in the mining of coal and draining mines in compliance with existing law." The repeal of this exemption is strongly urged by several of the Board's Committees.

(2) A complete classification by survey and analyses to show the kinds and amounts of domestic and industrial wastes carried by the major streams of the state should be made to provide an accurate picture of West Virginia stream conditions which can also serve as a basis for determining at later dates whether the streams are getting better or worse as regards pollution.

(3) In addition industrial and domestic surveys should be made (a) to show individual industries and municipalities the types of construction and treatment required to correct most effectively their particular stream pollution problems, and (b) as a basis for outlining compulsory action if such becomes necessary.

(4) Intensive planning should be initiated now for post-war construction of sewage treatment plants where careful investigations show an unquestionable need for such facilities.

(5) The Legislature should pass an act requiring county clerks to refuse the development of real estate plots for which methods of sewerage, sewage disposal, and water supply have not been approved by the State Department of Health.

(6) It is further recommended that the annual appropriation for the State Water Commission be made adequate to provide the personnel and equipment necessary to carry forward an effective program of pollution control.

Urban Sewage Disposal

(1) Where states are unable to agree upon interstate compacts to control effectively interstate stream pollution, the Federal Government should be encouraged to pass legislation to control such pollution.

(2) The West Virginia Public Health Council, as authorized by statutory law, should pass a regulation requiring the licensing of all sewage plant operators.

(3) The law regarding the collection of fees for sewer services beyond a municipal corporation is not very strong and should be amended to grant cities specific authority under this subject.

Sanitation

A. The West Virginia Milk Program

(1) The per capita consumption of grade A milk in West Virginia is approximately one-half pint per person per day. Consideration should be given to the active promotion of an intensified and coordinated program of education by all agencies under the guidance of dairy and nutrition specialists to increase the per capita consumption to at least one pint of safe milk per day.

(2) On the average there should be at least one sanitarian for each 100 dairies in order to provide adequate inspection and safeguard public health.

(3) Bangs disease control should be rigidly enforced in close cooperation with the State Department of Agriculture in a consolidated effort to eradicate this disease from the herds in the state as quickly as possible.

(4) Intensive and cooperative research should be carried forward by the West Virginia Agricultural Experiment Station to determine definitely the underlying cause or causes of mastitis so as to cope successfully with this disease which is becoming increasingly serious throughout the state.

(5) A research project should be undertaken jointly by the State Health Department and the West Virginia Agricultural Experiment Station for the purpose of improving where necessary the effectiveness and efficiency of scoring of all items associated with dairy inspection, including especially increased emphasis on the personal cleanliness and health of those engaged in the production and handling of milk.

B. Food Handling Establishments

(1) Local health officials should strictly enforce the food establishment regulation as adopted by the Public Health Council. Special emphasis should be given to the inspection of food and food products as a precaution against adulteration and the use of preservatives, and offenders should be severely punished.

(2) In addition the State Department of Health should provide adequate inspection at all slaughter houses to insure that meat butchered and sold within West Virginia is safe for human consumption. In order to make such inspection effective, it is recommended that consideration be given to the following items: (a) sanitary condition of buildings, yards, equipment, and facilities; (b) water supply, sewerage, and delivery equipment; (c) examination of livestock for slaughter; (d) establishment of health standards for working personnel; and (e) periodic reports covering the kinds and amounts of products sold or handled should be required by the State Department of Health and/or the State Department of Agriculture.

C. School Sanitation

(1) Local school boards should be made responsible to the State Board of Education for the installation and maintenance of adequate sanitary facilities. A definite plan should be put in operation cooperatively by the Departments of Health and Education to insure that the health standards of all schools will be improved over a reasonable period of years. Such a plan should require that the State Department of Health pass upon all school sanita-

tion plans prior to inauguration and inspect and approve, during construction and upon completion, all school sanitation projects, before these can be put in use.

(2) Greater responsibility for the health of the pupils should be placed on the teachers, and school officials should encourage and protect teachers in the reasonable discharge of such responsibilities.

(3) Copies of the local health departments' annual reports should be submitted to the State Superintendent of Schools to be distributed to and used by teachers and school officials as an aid in promoting a strong school sanitation program.

(4) Sufficient financial aid to carry forward a vigorous school sanitation program should be provided jointly through the Departments of Health and Education.

D. **Tourist Camps, Tourist Homes, Hotels and Other Lodging Places**

The present law pertaining to hotels is decidedly inadequate and should be amended to require that all hotels, tourist camps, tourist homes and other lodging places be operated in strict conformity with sanitary laws and regulations under the vigilant administration of the State Department of Health.

E. **Swimming Pools**

(1) Streams should be classified in order that the public can be informed as to the streams that are suitable for swimming.

(2) Artificial swimming pools should be classified and regulated on the basis of their equipment, operation and bacteriological results.

(3) As soon as materials are available, a program of improvement should be worked out for pools that do not meet minimum requirements. In order to retain operating permits, it should be mandatory that needed improvements be made.

(4) The public health council should pass a regulation requiring the licensing of all swimming pool operators.

(5) The State Department of Health in cooperation with the University and various colleges and schools throughout the state should conduct short courses to teach proper swimming pool operation.

(6) The State Department of Health or the Public Health Council should establish and enforce a regulation requiring all swimming pools to eliminate cross-connections between the pools and potable water supplies.

F. **Rural Sanitation**

Suitable provision should be made by the State Department of Health in cooperation with other appropriate agencies for an effective program of rural sanitation including a continuation and expansion of the water supply protection program and the construction of sanitary privies.

Nutrition

(1) Help should be given to communities faced with the problem of taking over the school hot lunch program. This should include specific information as to what foods to produce, how to care for these foods to conserve food value and eliminate waste, and how to prepare them properly. A way to give this help might be through neighborhood leaders. The school lunch should be a nutritional education project and not solely a feeding one.

(2) Production goals of the state should be geared to meet the nutritional needs of the people where possible.

(3) There should be a unified, over-all plan for nutrition work in West Virginia in order to reach every individual. This would require integration of the work of all agencies, departments, organizations, committees and individuals concerned to avoid unnecessary duplication of effort and working at cross purposes and should provide that:

(a) A state-wide survey be made to obtain detailed information on the nutritional status as well as on the food habits and prejudices of the people.

(b) Research in human nutrition be expanded within the state and the findings given practical application through all channels concerned with improving the well-being of the people.

(c) Action be taken to improve the nutritional status of those rejected by Selective Service or as volunteers when such rejection is directly attributable to malnutrition or improper food habits.

(4) In areas where mass feeding might become necessary because of emergencies such as floods, fires, or mine disasters it should be done insofar as possible in family groups; or some other provision should be made so that the values which come from shared family experiences will not be lost.

Communicable Diseases

(1) State and county health officers should enforce the isolation of the uncooperative tuberculous patient who refuses to take all necessary precautions incident to the spread of tuberculosis infection.

(2) The Law should be more rigidly enforced requiring that all persons infected with venereal disease receive treatment.

(3) A careful and thorough reexamination should be made of the program to control and eliminate communicable diseases in order to make sure that the available funds are spent in proper proportions in counter-acting those diseases which are most serious or likely to become so, which involve the largest number of people or are prevalent over the widest area of the state, and which constitute the greatest threat to the welfare of our people.

(4) The State Departments of Health and Agriculture should cooperate closely with local public health officials and county courts in a rigid campaign to eradicate rabies, including the elimination of the many roving bands of untaxed, uncontrolled dogs throughout the state. Provision should be made to launch such a program immediately in every municipality and county and to carry it forward relentlessly year after year. Considerable support and assistance have been promised by wild life organizations in all parts of West Virginia.

Carbon Monoxide

(1) Installation of all appliances should be done by a well-qualified person, and not just any one who happens to be around.

(2) Each appliance should be thoroughly inspected at regular intervals by a competent person, and properly repaired and adjusted if necessary.

(3) Side arm hot water heaters should not be installed in a bathroom or other small rooms if it is possible to place them elsewhere.

(4) All appliances, regardless of type, should be vented to the outside of the building.

(5) The State Department of Health in cooperation with other agencies should promote an intensive educational program to teach the people of West Virginia to guard against exposure to carbon monoxide. Such a program should include information regarding the proper installation, maintenance and repair of domestic and industrial equipment capable of producing carbon monoxide, the detection at least of the more common symptoms, and methods for combating and counter-acting its effects.

WEST VIRGINIA STATE PLANNING BOARD

COMMITTEES IN THE FIELD OF PUBLIC HEALTH

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WEST VIRGINIA
STATE PLANNING BOARD

SUPPLEMENTAL REPORT

of the

COORDINATING COMMITTEE

in the field of

PUBLIC HEALTH

December 10, 1945

West Virginia State Planning Board

HON. CLARENCE W. MEADOWS, Governor

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FOREWORD

This report is supplementary to the report of the Coordinating Committee in the field of Public Health published in June, 1943 (SPB-A2). It seems desirable to bring up to date the recent developments in public health work occasioned by the expansion of the State Health Department and new legislation passed in 1945. It seems desirable, also, to bring the vital statistics up to date, and this has been done up to and including the year 1944.

It is our hope that the material in this supplemental report will be quite helpful and of some value to each reader.

The Planning Board is indebted to Dr. A. L. Chapman for assistance in preparing this report, and to the Public Health Council for critical review. The Board desires also to acknowledge the financial assistance of the State Health Department with regard to publication.

COMMUNICABLE DISEASE CONTROL

Diagnostic and treatment procedures in the field of tuberculosis and venereal disease control have become so efficient that the expenditure of relatively large sums of money to eradicate these diseases is justified.

Because of the rapid expansion of both these programs separate Bureaus of Tuberculosis Control and Venereal Disease Control were established by the Public Health Council.

Basic sanitation has resulted in the practical elimination of the enteric diseases such as typhoid fever and the dysenteries.

The incidence of diseases for which immunizing agents are available has been greatly reduced but failure to immunize all children at the proper age still permits whooping cough, diphtheria, and typhoid fever to persist.

Gamma globulin for the prophylaxis of measles is now being distributed to physicians and health departments throughout the State.

To control the spread of communicable diseases the following plans must be carried out:

1. To obtain the immunization of every child at the proper age against every disease for which prophylactic vaccines are available.
2. Vaccines result in such a dramatic reduction in the incidence of illness and death that immunization should be urged for all children in the State.
3. Local health departments under the guidance of a qualified full-time health officer should cover every county in West Virginia, either as an individual county or as part of a district, to insure good environmental sanitation, restaurant sanitation, and communicable disease supervision.

The following table gives the number of cases of the various communicable diseases which have been reported to the Department each year over a five year period, 1940-1944 inclusive:

New Cases of Communicable Diseases Reported Each Year Over Five Year Period 1940-1944

	1940	1941	1942	1943	1944
Anthrax	——	1	——	——	1
Chickenpox	1394	1376	1433	1482	1435
Diarrhea	——	21	20	——	5
Diphtheria	338	309	327	233	165
Dysentery (bacillary)	99	94	14	6	22
Encephalitis	3	3	6	4	——
Erysipelas	7	5	3	——	——
Glanders	——	——	——	——	——
Gonorrhea	1465	1916	2256	2062	2787
Hookworm	1	2	1	——	9
Influenza	7544	45441	1051	6968	28836
Leprosy	——	——	0	——	——
Malaria	9	7	8	——	3
Measles	694	12605	5811	2214	9905
Meningitis	72	58	54	137	167
Mumps	371	1632	2205	810	604
Ophthalmia Neonatorum	10	9	6	5	6
Para-typhoid	8	4	5	2	17
Pellagra	10	7	1	1	2
Pleurodynia	——	——	——	——	——
Pneumonia	536	809	306	229	476
Poliomyelitis	662	49	49	30	222
Rabies (in humans)	2	1	2	1	1
Rocky Mountain Spotted Fever	4	6	4	15	15
Syphilis	2859	3726	4931	4076	3115
Scarlet Fever	1889	1940	1790	1927	3244
Septic Sore Throat	77	103	91	30	20
Smallpox	6	5	10	5	5
Tetanus	3	——	2	——	——
Trachoma	243	78	33	8	1
Tuberculosis (all forms)	1686	1893	1692	1643	1680
Tularemia	7	13	3	1	5
Typhoid Fever	209	229	149	152	144
Typhus Fever	1	——	——	3	——
Undulant Fever	5	7	3	3	6
Vincent's Angina	49	17	72	49	51
Whooping Cough	2233	2220	1260	2462	1226

VITAL STATISTICS

The prevention of disease must always await the determination of its location, prevalence, type, and rate of spread. This knowledge is dependent upon the regular collection of data, their tabulation and analysis.

Prior to the war vital statistics were collected concerning deaths, births, marriages, and illness. Subsequent to Pearl Harbor there arose a great demand for proofs of birth. This demand became so great it swamped the Division of Vital Statistics. The compilation and analysis of all data came to a standstill.

To modernize this division the newest type of photostat machine has been purchased and a complete set of automatic business machines has been acquired. These new installations will permit the tabulation of vital statistics and morbidity reports on a current basis and will permit the rapid analysis of the raw data that are assembled.

A field worker has been added to the staff to encourage a more complete and accurate reporting at the county level.

The future needs of this division include the employment of an analytical staff and the modernization of the local organization for collecting vital statistics rapidly and completely.

This section dealing with vital statistics is included because of the light such data throw on many important aspects of the total public health picture. Significant features of vital statistics are: (1) the ratio of births to deaths, that is, the number of births each year (or for any given period) as compared to the number of deaths during the same time; (2) the causes of deaths in terms of those preventable and those non-preventable; and (3) the influences affecting birth rates such as nutritional, functional, and abnormal environmental conditions such as occasioned by the many disturbing elements associated with war.

Births and Deaths 1935 to 1944 Inclusive

Year	Births	Birth Rate	Deaths	Death Rate
1935	41,775	22.4	18,342	9.9
1936	40,855	21.6	19,909	10.5
1937	42,246	22.1	19,191	10.0
1938	42,238	21.5	17,716	9.1
1939	41,331	21.8	17,452	9.1
1940	41,900	22.0	17,577	9.2
1941	43,983	23.2	17,783	9.4
1942	43,596	23.7	16,958	9.2
1943	43,372	24.7	17,363	9.9
1944	41,482	24.2	16,654	9.7

Examination of the mortality rates in West Virginia shows a large number of deaths occuring in the early age groups. The average number of deaths per year given below are estimated on deaths reported in West Virginia for the period 1939-1943 inclusive:

Average Number of Deaths During First Five Years of Life, 1939-1943

Average number of deaths per year, all ages	17.426
Deaths occurring during first day	549
Deaths occurring during first week	1,036
Deaths occurring during first month	1,347
Deaths occurring during first year	2,364
Deaths occurring during first five years	2,895

Cardiac disease continues to be the leading cause of death, but it is closely followed by cancer, intra cranial lesions of vascular origin, accidents, pneumonia and influenza, and nephritis. Diseases that are ordinarily classed as "acute Communicable" have ceased to be of a major importance as a determining factor in the crude death rate, but there is always inherent danger in these diseases and efforts must be continuous in the application of our knowledge of the methods of control to keep them at a low level.

Number of Deaths in West Virginia During 1944 For Some of the Principal Causes of Death, as Compared to a Ten Year Average, 1934-1943

Cause	Number During 1944	Average Number Over Ten Yr. Period 1934 - 1943
Heart	3,850	3,202
Cancer	1,525	1,410
Intracranial lesions of vascular origin	1,492	1,437
Accidents (all forms)	1,463	1,881
Pneumonia & Influenza	1,207	1,789
Nephritis	1,059	1,244
Tuberculosis (all forms)	758	898
Premature Birth	604	692
Diarrhea & Enteritis (all ages)	327	482
Diabetes	316	302
Diphtheria	23	81
Typhoid & Paratyphoid	19	60
Measles	58	54
Scarlet Fever	9	35
Poliomyelitis	25	19
Whooping Cough	61	128

It is frankly admitted that the cost of public health in West Virginia has increased during the past few years, but the reduction in the various communicable disease morbidity and mortality rates definitely proves that health is purchaseable provided a community is willing to pay the necessary price for it. Every state or community can determine its own death rate, within certain limitations, particularly as applied to communicable diseases, if programs of public health are formulated on a sound basis, properly financed, and placed in the hands of competent personnel.

THE LABORATORY

The scientific laboratory is fast becoming the nucleus of the medical service. As medicine evolves into a more exact science, laboratory diagnoses are replacing intuition, hunches, and guesswork.

The number of specimens examined annually in the State Hygienic Laboratory is increasing progressively each year.

At the present time further expansions of laboratory facilities is prohibited by lack of space. The present two improvised buildings are completely filled and woefully overcrowded.

To make even a pretense of maintaining the prestige of the West Virginia Hygienic Laboratory, won for it by the indefatigable efforts of the present director, one of two things must be done. Either a separate laboratory building with a minimum of 20,000 square feet of floor space must be built or an equivalent amount of floor space must be provided within the near future in a modern office building.

COUNTY HEALTH WORK

Diseases are controlled fundamentally by the activity of trained public health workers in local health departments. The staff of the state health department is not numerically sufficient to conduct public health programs in fifty-five counties.

At the present time there are only eight full-time health officers in the State. None of these has a degree in public health. At least thirty-three qualified health officers are needed. There are fewer than twenty-five qualified public health nurses and only thirty-two qualified sanitarians on duty, although many more are needed.

Only six health centers in West Virginia are worthy of the name. It will be necessary to construct twenty-three more health centers to provide adequate housing for the contemplated health departments, clinics, and miscellaneous health services.

In order to expand county health departments adequately there will be needed:

1. Additional state and local funds.
2. An accelerated training program for public health personnel.
3. Added inducements to make public health a career, such as:
   (a) A retirement system
   (b) Local lay support

MATERNAL AND CHILD HEALTH

The maternal death rate for West Virginia has dropped from 6.3 per thousand live births in 1925 to 2.9 per thousand live births in 1943.

This represents a decrease in maternal mortality of 54 percent in 18 years.

The corresponding decrease in the entire registration area of the United States was from 6.5 to 2.5 or 62 percent.

The infant death rate in West Virginia dropped from 79.8 per thousand live births in 1925 to 52.1 in 1943. This represented a decrease of 35 percent in 18 years.

The corresponding decrease in the entire registration area of the United States was from 71.7 to 40.4 or a decrease of 44 percent in 18 years.

There are still many things that can be done to decrease further the risks of childbirth and infancy:

1. A program must be developed to make incubators available to every premature infant.
2. The number of well baby conferences should be expanded to cover the State adequately.
3. The number of prenatal and postpartum clinics should be expanded likewise.
4. Midwives should gradually be replaced by physicians.
5. Adequate standards for the care of mothers and infants in public and private hospitals should be adopted and complied with.
6. An educational program stressing the importance of good nutrition, blood tests, prenatal and postpartum care should be developed.

The figures in the table below show that West Virginia has consistently a lower maternal death rate than that for the entire United States, but a higher infant mortality than that for the nation. This is difficult to explain as there is such a close relationship between infant and maternal death rates. Nevertheless, both are becoming lower in West Virginia. Further endeavors relative to maternal and child hygiene and nutrition should reduce these rates even more.

Comparison of Maternal and Infant Death Rates (Per 1,000 Live Births) For West Virginia and the United States 1940 — 1944

	1940		1941		1942		1943		1944	
	W. Va.	U. S.	W. Va.	U. S.	W. Va.	U. S.	W. Va.	U. S.	W. Va.	U. S.
Maternal Death Rates	3.3	3.8	2.8	3.2	2.3	2.6	2.9	2.5	2.2	N. A.*
Infant Death Rates	53.9	47.0	60.9	45.3	53.0	40.4	52.5	40.4	52.1	N. A.

*N. A. Not Available.

PUBLIC HEALTH NURSING

There is a dearth of personnel in the public health nursing field in West Virginia because nurses trained in nurse training schools associated with small hospitals are not properly qualified to become public health nurses. There are only twenty-eight public health nurses now employed in West Virginia, a totally inadequate number.

To provide adequate public health nursing staffs in local health departments in the post-war years it will be necessary:

1. To increase materially the amount of money spent for public health nurses.
2. To raise the standards of nurse training schools.
3. To provide good local health departments in modern health centers.

PUBLIC HEALTH EDUCATION

The State Department of Health has recently recognized the need for an expansion of health education in the State Department of Health.

1. A director has been employed.
2. Health education consultants in Tuberculosis Control, Venereal Disease Control, and Cancer Control have been employed.
3. Four trainees for the position of local health educator have been sent away for one year of schooling in health education.
4. A library for the State and County Health Departments has been opened.

In line with this developing program it will be essential to place a local health educator eventually on the staff of each county or district unit.

It is the sincere desire of the State Department of Health to cooperate wholeheartedly with the Department of Education so that health educational material may be presented to every school child in West Virginia from the first day of kindergarten to the graduating day at high school.

It is likewise desirable that all voluntary health agencies be utilized in health education to the greatest degree possible.

VENEREAL DISEASE CONTROL

It was not until the middle thirties that the words syphilis and gonorrhea were used extensively outside the dictionary. Since the period of liberation in 1936, public knowledge concerning both of these diseases has permitted the inauguration of a practical control program.

Prevalence of Syphilis Among West Virginia Registrants by Race and Age Based on Blood Tests Performed From November 1, 1940 Through August 31, 1941.

Race	Age	Total Persons Syphilis Detected		Total Persons Tested		Syphilis Rate Per 1,000 Persons Tested	
		W. Va.	U. S.	W. Va.	U. S.	W. Va.	U. S.
White	18-20	11	195	956	17,614	12	11
	21-25	326	9,677	13,626	947,776	24	10
	26-30	289	9,952	6,055	474,300	48	21
	31-35	226	9,658	2,860	254,633	79	37
	36-40	15	682	137	15,373	109	44
Total		867	30,164	23,634	1,709,696	37	17Av
Colored	18-20	9	1,685	328	15,931	27	105
	21-25	128	22,588	1,082	117,819	118	191
	26-30	149	19,666	611	66,702	244	294
	31-35	115	15,190	399	42,451	288	357
	36-40	7	1,211	19	3,224	368	375
Total		408	60,340	2,439	246,127	167	245Av

There are today fifty venereal disease clinics and one rapid treatment center serving West Virginia. This is a sufficient number of treatment centers to serve the State.

The prime needs now are:

1. Increased personnel for case-finding and follow-up visits in the counties.
2. A more widespread dissemination of information concerning sex hygiene and the venereal diseases in the schools.
3. More widespread use of blood testing as a case-finding device.

4. A more rigid enforcement of laws preventing "pick-ups" in beer establishments.
5. An intensified campaign to solicit community support for the prevention of the venereal diseases.
6. The provision of more and better training facilities for venereal disease clinicians.

TUBERCULOSIS CONTROL

Although the incidence of tuberculosis has decreased remarkably in the past two decades, some 800 people die of it needlessly each year in West Virginia.

Tuberculosis is preventable. If and when all active cases are discovered and are isolated at home or in well administered, properly staffed sanitaria, no further cases of tuberculosis can be contracted.

Therefore, the State Department of Health, with the active cooperation of the United States Public Health Service, has now embarked on an ambitious campaign to wipe out tuberculosis in a generation. Expenditures in 1944-45 for prevention totalled approximately $10,000. In 1945-46 these expenditures will be increased to $60,000. All of the tuberculosis control funds thus far are donated to the State Department of Health by the Federal Government.

For the success of our Tuberculosis Control program it will be necessary:

1. To secure a substantial State contribution to Tuberculosis Control.
2. To obtain sufficient field personnel in local health departments in order to insure case-finding and adequate follow-up service.
3. To establish permanent tuberculosis diagnostic clinics throughout the State to which every resident will have easy access, and to utilize as far as possible the practicing physicians of the community in these clinics.
4. To reorganize completely the administration of state tuberculosis sanitaria.
   (a) Omit payment by tuberculosis patients.
   (b) Establish a Merit System for employees.
   (c) At least double the size of the professional staff.
   (d) Increase salaries sufficiently to attract and hold qualified nurses and attendants.
   (e) Establish medical social service units to aid the physicians in handling the economic, social and emotional problems related to illness.
   (f) To increase the budgets of the sanitaria so that the rendering of proper care to tuberculosis patients may be made possible.
   (g) To provide a substantial income for the indigent families of patients with tuberculosis who voluntarily accept sanitarium care.

Unless and until the "penny wise, pound foolish" concept of tuberculosis control is abandoned, tuberculosis will remain as one of the ten most common causes of death in West Virginia.

The following table shows the number of tuberculosis cases and the amounts expended for this purpose:

Number of Tuberculosis Cases and Amount Expended

Disease	Est. New Cases Per Year 1944	Est. Tot. Cases in State Dec. 31 1944	No. Cases on Record at State Health Dept. Dec. 31 1944	Tot. State Expend. for Treatment 1944	Av. Expend. Per Case Recorded 1944
Tuberculosis	2,274	7,580	1,680	$990,699.22**	$589.00

**Includes actual expenditures in 1944 at Denmar ($107,046.45); Hopemont ($419,242.66); and Pinecrest ($464,410.11) sanitoriums and for the Tuberculosis Field Clinic ($10,000) according to the Board of Public Works Budget Document for the biennium.

CANCER CONTROL

Attempts to prevent deaths from cancer began on a large scale in West Virginia with the passage of the Cancer Control Bill in 1943 and the establishment of the Division of Cancer Control in the State Department of Health.

Early diagnosis and early treatment constitute the two chief weapons of the Cancer Control Division today.

Eleven diagnostic clinics have already been established in the State. Eight more are needed. With these nineteen clinics in operation, diagnostic facilities will be reasonably accessible to every county.

In addition, the future needs of this program will be:

1. To increase the social services needed to make hospitalization possible.
2. The extension and intensification of the educational program already begun.

INDUSTRIAL HYGIENE

Ordinarily there are around 300,000 industrial workers in West Virginia. These workers are in manufacturing enterprises, coal mining, oil and gas production, quarries, construction, transportation, communications, and utilities. This means that the health of approximately one-seventh of the population is directly involved and a much larger part than this is affected indirectly when we consider the members of the families of the industrial workers.

Much can be done to benefit the health of industrial workers. Hazards can be eliminated, sanitation can be improved, good restaurants can be provided, physical examinations can be made, and nursing and medical services can be extended.

To fulfill the objectives of a good industrial hygiene program it will be necessary to:

1. Increase the number of physicians, engineers, chemists, and nurses available for consultant services.
2. Obtain adequate laboratory facilities in a central laboratory.
3. Conduct more extensive research work to determine practical means of eliminating specific industrial hazards.
4. To utilize as far as possible the services of the private practicing physicians in the various localities in the industrial hygiene program.

MENTAL HEALTH

The same shortage of trained personnel and funds that hampers the operations of tuberculosis sanitaria operates to the detriment of mental patients. The State mental hospitals cannot conceivably render an effective rehabilitation program for mentally ill persons in West Virginia with the present staff and without more ample funds.

There are no prevnetative mental hygiene clinics conducted by public health agencies in West Virginia. Although the State Department of Health is permitted by law to establish a Bureau of Mental Hygiene, no psychiatrists and no funds are available to operate such a bureau.

Wherever mental hygiene services have been established, the early detection of mental illness has resulted in a significant decrease in the need for hospitalization. In the long run considerable sums of money have been saved by the public agencies which maintain these clinics.

Mental illness has been shown to be definitely on the increase. Unless preventive programs are developed, there is no doubt that there will be an ever increasing number of admissions to State mental hospitals with a further deterioration in the already too primitive type of treatment now available.

Definitely needed are:

1. Revision of commitment laws.
2. Reorganization of the mental hospital program.
   (a) Place all employees under the Merit System.
   (b) Increase salaries in order to attract and hold qualified personnel.
   (c) Increase the staff to recommended size.
   (d) Provide a separate hospital for the treatment of epileptics.
   (e) Each mental hospital should have as director a well trained psychiatrist.
3. Establish a Bureau of Mental Hygiene in the State Department of Health provided with an adequate staff and ample appropriations.
4. Provide in-service training programs at State mental hospitals for private physicians.

NUTRITION

The promotion of programs designed to get more nutritious and better prepared foods on the tables of West Virginians is the responsibility of many agencies, all represented on the State Nutrition Committee.

The State Department of Health has employed a nutrition consultant who, after a period of postgraduate training, will develop an educational program in cooperation with representatives of other agencies interested in good nutrition.

The educational program should be particularly emphasized in the schools where the most permanent good can be done.

Malnutrition is often based on the economic situation in a community but even more often results from ignorance on the part of individuals and families.

The nutrition program is of such a nature it must be integrated with all of the other public health and educational programs in order to be effective, and must have the support of the private practicing physicians in the State.

DENTAL HEALTH

Recognizing the great need for making preventive and corrective dental services available to everyone in the State, the Public Health Council, at the Health Commissioner's request, has established a Bureau of Dental Hygiene.

This bureau is directed by a dentist who is well prepared in public health dentistry. As the program develops the greatest needs will be:

1. To expand the educational program already begun.
2. To conduct fact-finding surveys to authenticate the need for more dental services.
3. To develop a plan for the dental care of all the citizens of the State that will eliminate the bad mouth conditions now prevalent and which will at the same time be acceptable to the State dental association.
4. To promote the teaching of good dental hygiene as a part of all public health and educational programs.

CRIPPLED CHILDREN

The Crippled Children's Division of the Department of Public Assistance is doing a good job in providing care for crippled children.

It has been realized only recently that rheumatic fever kills or cripples more children than any other childhood disease.

A child with a defective heart is just as much a cripple as a child with a deformed leg.

Therefore, it is urgent that the State Department of Health be permitted to establish a preventive and rehabilitation service for the victims of rheumatic fever. This should entail the construction or purchase of a crippled children's hospital in which these and other crippled children would receive the best care obtainable by a trained professional staff.

As yet the problem of the child born a "spastic paraplegie" has not been tackled. These children can, to a certain extent, be benefited by proper hospitalization. They should not be confined in a mental hospital, yet today no other institution can accept them. They should be admitted and rehabilitated in a State administered crippled children's hospital.

Many crippled children remain untreated because trained professional people are not available to find them.

FOOD AND DRUGS

Today what supervision there is over the foods we eat and the drugs we buy in West Virginia is divided among many State agencies.

The Department of Agriculture, the State Police, the State Board of Pharmacy, and the State Department of Health all have a divided responsibility in food and drug control.

There is a real need for legislation clearly defining the duties and responsibilities of the various agencies charged with maintaining food and drug standards.

MEDICAL CARE

The trend towards change in the medical care program is becoming more apparent. Since no policies have been formulated by the Public Health Council concerning medical care, it would seem premature to anticipate changes in the existing set-up. The State Department of Health, being a nonpolitical body, would be the logical agency, however, to administer any medical care program that might be organized by the legislature in the future.

GENERAL HOSPITAL CARE

The 1945 Legislature passed a bill designating the State Department of Health as the sole agency for cooperating with the Federal Government in preparing plans, making surveys, and accepting federal funds for hospital and health center construction.

At least nine rural areas in West Virginia need small hospitals to make hospital services reasonably available. Today there are enough hospital beds in West Virginia to serve the State population. However, the beds are located chiefly in large centers of population and the service is not uniformly of acceptable quality.

Needed are:

1. A hospital licensing law setting up minimum standards of hospital construction, equipment and care.
2. Subsidization of publicly owned rural hospitals to provide good hospital care in many rural areas.
3. Subsidization of privately owned hospitals that agree to incorporate on a non-profit basis to bring the cost of hospital care within the reach of many more needy citizens.

LEGISLATION

(A) *Legislation passed in* 1945.

1—*Senate Bill 9:* This bill was passed to provide an institution for the care of senile mental patients. Until now patients badly needing care for mental illness have had to be confined in county jails for months pending admission to the ever crowded State mental hospitals. By removing from these mental hospitals ambulatory senile patients, space will be provided for the acutely ill mental patients who are now unable to be admitted. Space will also be provided for the study of prepsychotic patients who by proper care and treatment may be prevented from becoming mentally ill.

2—*Senate Bill 93:* This bill requires the continued enrichment of flour and bread with vitamins and minerals after federal war time regulations are rescinded. The Department of Agriculture is responsible for the enforcement of this bill.

3—*House Bill 9:* This bill provides for compulsory serologic test for every pregnant woman resident in West Virginia. Amendments insure that no hardship will be worked on pregnant women who for unusual reasons are unable to comply with the law. The chief value of the law will be educational and it is already being accepted voluntarily to a remarkable extent. This law will do much to reduce the incidence of congenital syphilities each year. The law is administered by the State Department of Health.

4—*House Bill 12:* This bill provides that the State Department of Health shall have advisory medical supervision over State mental hospitals, emergency hospitals, and tuberculosis sanitaria. It is a bill which will permit the Health Commissioner to suggest policies regarding the professional staffing and conduct of the institutions named in line with policies promulgated by the Public Health Council.

5—*House Bill 50:* This bill instructs the Governor to request the Public Health Council for a report on the qualifications and suitability of any person to be appointed superintendent of any State hospital or sanitarium or institution where such a person is required by law to be a physician.

6—*House Bill 51:* This bill instructs the Governor to request a report of the West Virginia State Medical Association on the qualifications and suitability of a person to be appointed Commissioner of Health and the medical members of the Public Health Council. It also requires a similar report from the State Dental Society as to the dental member of the Public Health Council.

7—*House Bill 321:* This bill authorizes the State Department of Health to cooperate with the Federal Government in its hospital construction program. The State Department of Health is designated as the sole State agency to conduct surveys concerning the need for and location of health centers and new hospitals and to administer any funds made available for such surveys and construction.

A bill now pending in the United States Senate would provide $100,000,000 to be allocated to the several states for the purposes enumerated above.

(B) *Legislative Needs in Public Health.*

1. A bill to rescind restrictive tax limitation laws which make it impossible for county courts to appropriate reasonable sums of money for the maintenance of adequate county and district health departments.
2. A bill to revise the methods by which mental patients are committeed to the State institutions.
3. A bill to provide for the creation of the following divisions in the State Department of Health:
   (a) Food and Drugs
   (b) Hospitals
   (c) Medical Care
   (d) Crippled Children
4. A bill to provide for the construction and maintenance of the following hospitals to be administered and operated by the State Department of Health:
   (a) Crippled Children's Hospital
   (b) Hospital for the care of epileptics
5. A bill to provide for the licensing of hospitals for the purpose of insuring minimum standards of hospital care.

6. A bill to provide for a four-year medical school of West Virginia University.
7. A bill to subsidize the medical education of needy medical students in return for a contract to practice medicine for five years in rural areas of West Virginia as directed by the Public Health Council.
8. A bill to regulate and raise the standards of nurse training schools to meet national standards.
9. A bill permitting and establishing the conditions necessary for the combination and administration of county-city health departments.
10. Codify the basic public health rules and regulations adopted by the Public Health Council.
11. A bill establishing a retirement system for Health Department employees.
12. A bill to provide an adequate salary for the State Health Commissioner.

CONCLUSION

Medical science has added through war time research and experimentation many spectacular and effective weapons. These new therapeutic agents can be used effectively to reduce the incidence of many diseases.

However, before these scientific preventive and treatment measures can benefit the public, State, district, and county health departments must be staffed with a full complement of qualified well-trained public health personnel. This will require time and a significant increase in public health appropriations.

There is no longer any doubt that every dollar spent in preventing disease and promoting optimum health results in the saving of many dollars that would otherwise be spent in treatment and rehabilitation.

Vision and foresight on the part of legislators and appropriating bodies now will pay greater dividends in longer lives and healthier citizens tomorrow.

West Virginia State Planning Board

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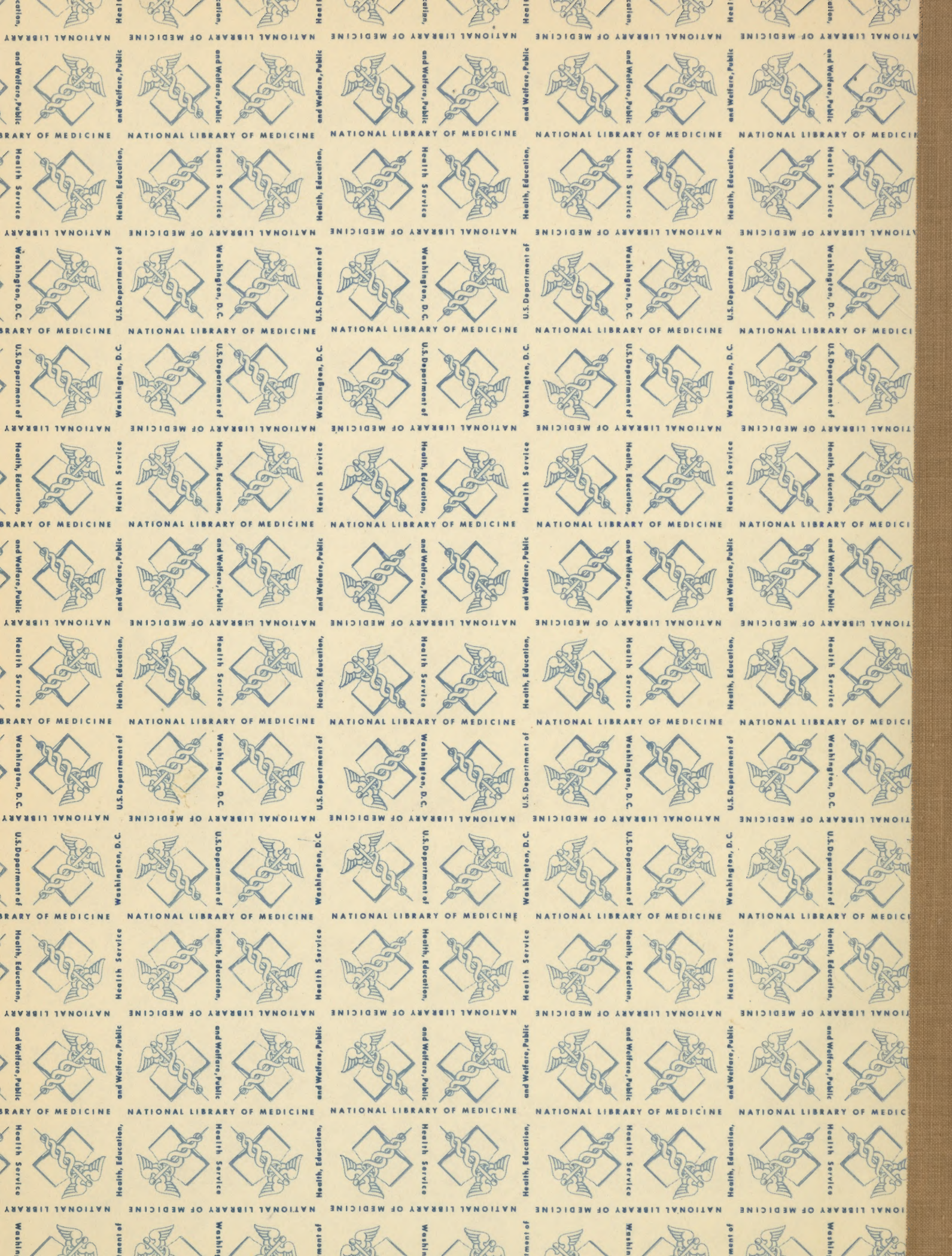
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